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ABSTRACT

This handbook was developed for persons in Virginia without formal teacher training who are teaching a laboratory course in trade and industrial education for the first time. The guide covers some of the issues that a beginning teacher must address in the first few weeks of school. The document also provides background information for the teacher-education courses required for licensure. The guide contains 10 sections that cover the following topics: (1) the first week of school; (2) learning and teaching; (3) managing the classroom and the laboratory; (4) organizing course content; (5) teaching methods and instructional aids; (6) implementing competency-based education; (7) evaluating student achievement; (8) state requirements; (9) teacher licensure; and (10) a bibliography containing 25 references. Five appendixes include the following: resource material, sample safety forms, Vocational Industrial Clubs of America information, discipline, and planning considerations. (KC)

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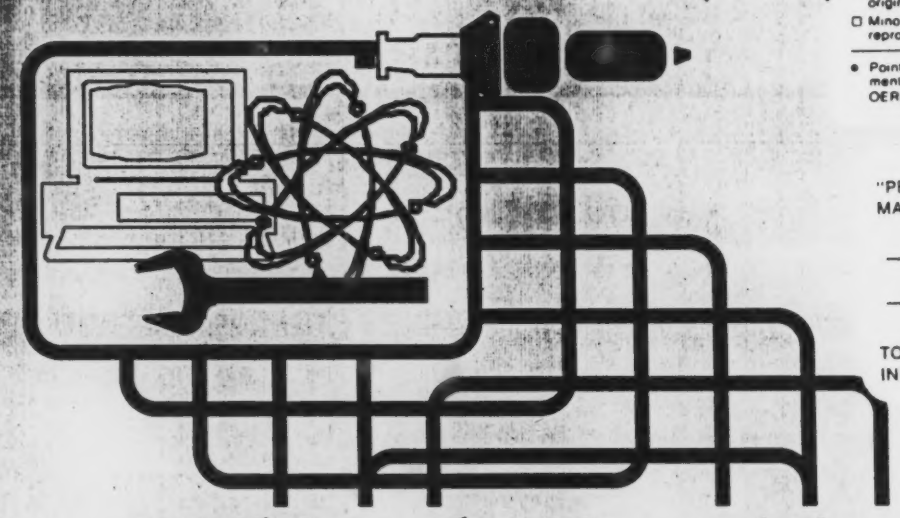

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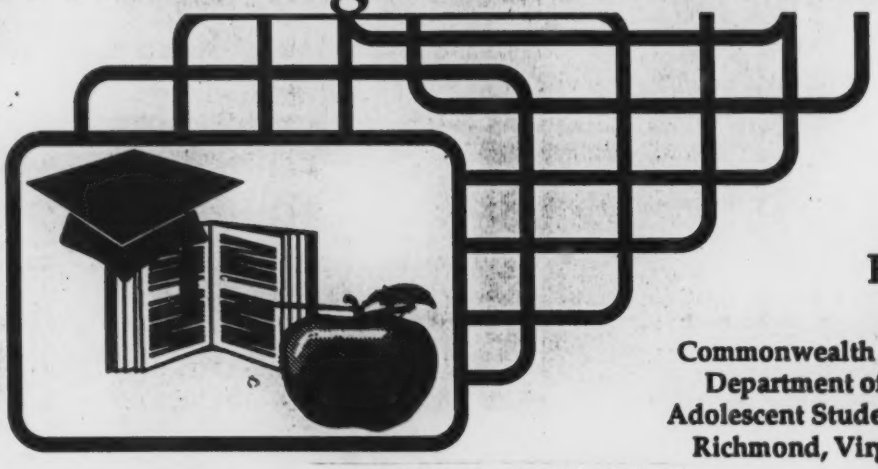

1993
Revised

Commonwealth of Virginia
Department of Education
Adolescent Student Services
Richmond, Virginia 23216

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TRADE AND INDUSTRIAL EDUCATION
BEGINNING TEACHERS . . . MAKING THE TRANSITION

A Handbook for Beginning Trade and Industrial Education Laboratory Teachers

Developed

by

Trade and Industrial Education
Division of Adolescent Education
Virginia Department of Education
Richmond, Virginia 23216

in Cooperation with

Virginia Vocational Curriculum and Resource Center

Revised
1993

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INTRODUCTION

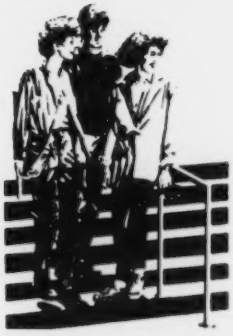
This handbook has been developed for the individual who will be teaching a Trade and Industrial Education laboratory course for the first time and who has not received formal teacher training. The document is designed to cover some of the issues that the beginning teacher must address in the first few weeks of school. Thus, the handbook serves as merely a guide for getting started and does not contain an exploration of the many complex issues associated with the first full year of teaching.

The beginning teacher will find that the contents of this document serve as background information for the teacher-education courses required for licensure. Also, before planning any teaching strategies, the beginning teacher must be fully cognizant of the policies and procedures of the local school system.

THE FIRST WEEK OF SCHOOL

An Introduction to the Section

Most teachers can describe in detail the first day they taught. Whether the memory survives as painful or pleasant, almost every teacher can comment on what he or she did differently the following year. This guide opens with an introduction to teaching as experienced during the first week of school and is based on the recommendations of successful Trade and Industrial Education teachers. Many broad topics, such as safety, grades, and discipline are introduced. They are simply mentioned in this section but discussed in more detail in later sections. "The First Week of School" presents a picture of some of the teaching activities you will perform; the rest of the guide contains general information on how to accomplish these activities.



Before the Students Arrive

The success of the first day of school as well as that of the days that follow depends greatly on the amount of preparation and organization the teacher manages to accomplish before the first bell rings. Each beginning teacher faces the challenge of preparing for instruction. However, a number of circumstances will affect how much the teacher can accomplish before the students arrive.

Teachers are hired at various times of the year, and each teaching situation differs in some way from any other. Some teachers are hired early in the summer to replace instructors who have already placed orders for supplies and who have left clean, well maintained shops. Other teachers are hired to establish brand new programs and must start by ordering the equipment and tools necessary to teach the occupation. Still other teachers arrive to find some things are in good working order but expendables and tools need to be purchased. Because of the many variables, any

attempt to specify a procedure for preparing for the first day of school would be incomplete. Nevertheless, beginning teachers need to ascertain the status of their programs as soon as possible. Determining the answers to questions such as those that follow will help in planning for the arrival of the students.

1. What are you going to teach? The skills, attitudes, and knowledge of the good beginning employee in your occupation constitute the curriculum for your program. (Information concerning curriculum guides is provided in the section "Implementing Competency-Based Education.")

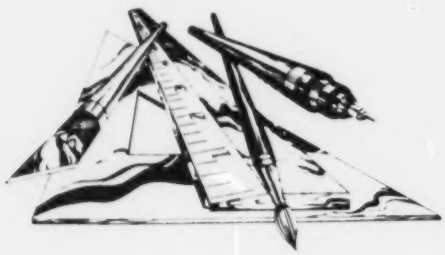
2. Is there an inventory of the tools, equipment, and other material in your laboratory? If so, check it to ensure it is accurate. If not, conduct an inventory.

3. Do manuals, workbooks, or textbooks need to be ordered?

4. Have supplies, replacement items, and equipment been ordered?

   A. If orders have been placed but not delivered, find out what has been ordered and the quantity. This information will help in planning demonstrations, practical exercises, and performance tests.

   B. If orders for equipment or instructional material need to be placed, see your immediate supervisor or principal. Budgets, procurement procedures, and requisition forms vary from school to school.



5. What forms, records, and procedures are mandated by the school? Teachers sometimes have to collect activity or other types of fees, and most schools have an accounting procedure for collecting, depositing, and withdrawing funds. Certain absentee forms are often required. Students may be expected to purchase uniforms, tools, or personal safety equipment. You will need to know this information in planning for the first few days of school.

6. How many students are enrolled in each of your classes? You will need this information to complete your roll book, organize work stations, plan demonstrations, prepare handouts, etc.

7. Does your school or school system distribute a student handbook? These handbooks contain information for students concerning attendance regulations, dress codes, and procedures for obtaining permission to leave school early or arrive late. You will be expected to enforce school rules and regulations.

8. Where do you obtain audiovisual equipment? Many schools have an instructional media center where teachers sign up for equipment such as filmstrip or slide projectors, televisions, etc. Information about obtaining equipment will help you in planning the use of audiovisual aids.

Day One
The Students Arrive

The old adage associated with the first day of school is "**be over-prepared**." Although such advice is just as appropriate for the rest of the school year, it is especially true for Day One. How you handle the many demands of the **first few days sets a tone for the entire year**, and students are quick to judge how you will enforce the rules, handle discipline, and present instruction.

The following outline contains suggestions of items to be covered in the first day or two. The school administration will very likely have forms, announcements, and other requirements that you will need to incorporate in your plan for the first day.

Introductions

- Introduce yourself to the class. Many teachers write their names on the chalkboard. In most schools, teachers are referred to by their last names.
- Call the roll. Before school starts, you will receive a list of the students enrolled in your classes. Ensure that the students in the room are supposed to be there. There will be many new students who are not familiar with the school, and some may have entered the wrong room inadvertently.
- Provide a brief explanation of your work experience. You have worked in an occupation that is of interest to the students in your class, and a little information about your work shows the students why you are considered a subject matter expert.
- Gather student information. Many teachers recommend spending a few minutes of class time at this point to obtain information about each student. Some teachers provide students with file cards and have the students complete the cards with information such as

  Student's full name
  Student's birth date
  Parents' or guardians' full names
  Home address
  Home phone number
  Parents' or guardians' work phone numbers
  Homeroom number
  Class schedule
  Hobbies.

Course Requirements

- Inform the class of the course content. Some teachers distribute course outlines, competency records, or a course syllabus.
- Specify textbooks, notebooks, workbooks, or other types of material that students must purchase.
- Tell the students what they are expected to bring to class each day.
- Provide specific information about the tools, personal safety equipment, and clothing students must purchase. Some systems require that students purchase their own safety equipment such as goggles and hard hats. Students may also be required to purchase items such as uniforms or coveralls.
- Explain the operational rules of your course. If students must change into uniforms or special clothing, discuss locker arrangements and time allowed for clothing changes. Explain laboratory procedures for cleanup, storage of tools and equipment, and other aspects of the day-by-day operation of your program.
- Review school/laboratory policies concerning dress codes, jewelry, etc. Some school systems distribute a school policy handbook to each student. In all likelihood, you will have additional policies to discuss with your class, such as

  clothing not appropriate for your shop
  use of hair nets, face shields, etc.
  shoes that should or should not be worn
  jewelry that should not be worn.

- Explain any fees that may be required, such as lab or material fees.

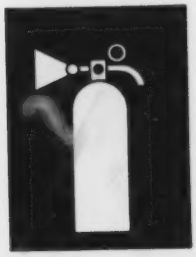
Attendance

- Explain school policy concerning attendance, tardiness, and early dismissals.

- Stress the importance of attendance. Emphasize that attendance will be taken every day. Some teachers call the roll daily; some use seating charts or work station charts. For the first few days, it is usually helpful to call the roll. At the end of a week or so, you will know the names of all of your students and may find that a formal roll call is not necessary. However, daily attendance information is probably required by the school division, and you must have a record of students who were and were not in class each day. (Attendance or roll books may be considered legal documents; it is of the upmost importance that attendance records are accurate and up-to-date.)

- Explain the relationship of attendance to certification or apprenticeship considerations. In some programs, students must have a specific number of hours of instruction to meet state licensure requirements or to be allowed to take certain licensing examinations.

Safety Requirements



- Emphasize the personal safety equipment that is provided to each student. Specify the items that the student must purchase.

- Show students the exact location of safety equipment in the shop. Point out fire alarms, fire extinguishers, hazard zones, etc. Review school policy for fire drills and evacuation procedures.

- Explain your requirements concerning safety tests, safe use of equipment, storage of hazardous material, and care and maintenance procedures.

Discipline

- Discuss school discipline policies such as demerits, suspension, etc.

- Describe the behavior that is expected in your class and explain that school and laboratory rules will be enforced.

Demonstration/Practical Exercise

- Stimulate student interest by demonstrating the operation of a special machine that students will learn to use (e.g., computerized numerical controlled machine, printing press, lathe, CAD system).

- Involve students by having them perform a simple practical exercise or experiment.

Grading System

- Explain the grading system used in your school.

- Explain how grades will be determined in your class. Discuss performance tests, written tests, and other forms of evaluation, and explain how they will be used in determining grades.

- Note any special considerations about grades.

  Do students need a certain grade in your class to enroll in an advanced class (a Year II or Year III of your program)?

  Is there a policy regarding parental notification of students who are failing?

  Are students who excel exempt from special tests or exams?

School-Required Forms

As mentioned, the school administration may require that certain forms be completed by you or the students and turned in by the end of the day. Allow time for these activities.

Day Two and the Rest of the Week

Continue the process initiated in Day One by taking attendance, completing any unfinished business from your plan for the previous day, and maintaining a comfortable learning environment. During Day One you explained the day-by-day procedure that students would be expected to follow; today establish the routine you prescribed so that students will know that you are consistent and forthright. In addition to the items covered during the first day, you may want to continue your orientation period by incorporating some of the following suggestions in your instructional plan.

Collection of Forms and Fees

- Collect any fees that are required. (Note: It may be useful to have the students involved in some sort of project while collecting money and writing receipts. This might be a good time to administer a pretest, such as one on basic knowledge of hand tools or general math skills.)

- Collect forms required for your course or for the school.

Laboratory/Classroom Tour

- Assign lockers.
- Review safety procedures.
- Explain storage procedures.
- Indicate work stations.
- Point out where references, cross-reference manuals, operators' manuals, and other types of texts are located.
- Note any specialized equipment or machines.

Vocational Industrial Clubs of America (VICA)

- Present information about the Vocational Industrial Clubs of America. (See the VICA advisor in your school for student organization membership information.)

Distribution

- Distribute manuals, workbooks, or textbooks. (School policy may require that certain forms be signed by parents before any material can be issued.)

- Assign work areas and any tools or equipment that individual students will use during the year.

Assignments

- Determine the background knowledge of your students in areas pertaining to the occupation. If all of your students know how to read a rule, for example, you will not need to spend time on this skill. Teachers use pretests and special assignments to detemine the skill level of their students in special areas.

- Begin work teaching initial occupational skills. The school year now begins in earnest.

LEARNING AND TEACHING

Learning

As noted in the previous section, each beginning teacher must prepare for instruction. A key to that preparation is understanding how people learn. If everyone learned in exactly the same way, teaching would be a relatively easy process. However, learning is a complex subject. Research includes studies of theories of learning, learning styles, and processes of learning to name just a few. A number of references contain information about the various aspects of learning, and many colleges and universities offer courses in this area. Obviously, a topic of such magnitude cannot be fully covered in this type of document, but for the beginning teacher, an introduction to some of the precepts associated with learning may help you in planning how to teach the background knowledge and basic skills of your occupation.

Some Information about Learning

Educational experts have identified certain factors about learning that apply to students whether they are studying history, science, drafting, or masonry. Some of their research findings include the following:

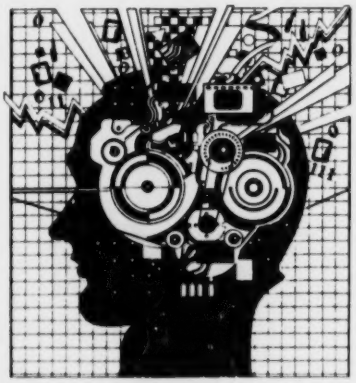
- Students learn best when they understand the reason for learning. Teachers who clearly explain the objective and purpose of the lesson motivate their students to learn.

- The most effective learning takes place when the lesson is presented clearly, in an organized, step-by-step fashion. If the presentation is jumbled, contains incorrect information, or if essential information is omitted, it is likely the lesson will have to be retaught. Reteaching involves both "unlearning" and starting over, making learning doubly difficult.

- Effective learning takes place when the experience is satisfying. If the presentation is made in such a way that the student can then perform the task correctly, the student will feel a sense of pride and accomplishment.

- Appeals to the senses form an impression. Learning experiences that are made stimulating and vivid by incorporating sensory appeal are more lasting than a routine or mundane approach. Having students perform an operation rather than simply read about it strengthens learning.

- One of the oldest teaching methods--drill and practice--is still one of the most effective. After presenting the lesson, teachers have their students apply their learning by practicing the skill. Successful teachers do not expect their students to know how to do something just because they have seen someone else do it.



The Learning Process

As noted above, sensory appeal is directly involved in learning. Light, sound, and smell, for example, stimulate the senses, which in turn causes the learner to form an impression. This impression is the beginning of learning as described in the examples below.

Sight Learners use the sense of sight to observe demonstrations, read directions, study diagrams, and view pictures.

Hearing Students listen to the experiences of others and receive instructions. Their sense of hearing may be used to analyze the operation of a machine.

Smell Through the sense of smell, the learner may be alerted to a possible danger, such as the smell of burning rubber. On the other hand, the learner may smell the pleasant aroma of a cake that he or she has prepared correctly.

Touch The sense of touch allows the learner to detect heat and cold, determine a degree of roughness or smoothness, and perceive the texture of an item.

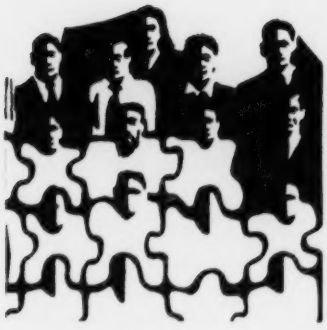
Taste This sense allows the learner to determine the flavor and the sweet, sour, salty, or bitter qualities of a substance.

Kinesthesia Kinesthesia is the sense of feeling through muscles, tendons, and joints. Through the pull on muscles and tendons, the learner determines the heaviness of an object.

The impressions that students receive may lead to an understanding or to an ability to do something the students could not do before. Teachers try to make a lasting impression by incorporating in their instruction various appeals to the senses. Research into the learning process shows that individuals remember

10% of what they **read**.
20% of what they **hear**.
30% of what they **see**.
50% of what they **hear and see**.
70% of what they **say**.
90% of what they **perform**.

Even if learning meant simply incorporating the information described so far, teaching would still be a fairly simple process, but, as mentioned, learning is complex. In teacher-education courses, you may study concepts such as the Transfer of Learning and Motivation theories; Laws of Learning, such as the Law of Primacy and the Law of Effect; the Levels of Learning and how these levels are built upon; and Styles of Learning, such as Intuitive Learners and Incremental Learners. These concepts are related directly to an aspect of learning that teachers face daily--the individual differences within each classroom.



Individual Differences

You will probably realize at the end of the first day of school that the students in your classes differ in age and maturity. By the end of the first week, you will recognize differences in ability, background, and interests. The individual differences within each classroom present a continuing challenge to the teacher because these differences affect how students learn. The good teacher uses a variety of teaching techniques to provide for these individual differences. (More information about handling individual differences is presented in the section "Teaching Methods and Instructional Aids.") In addition, you may have a student with a handicap, a learning disability, or a student who is exceptionally talented. These students are often referred to as "Special Needs" students as described below.

Special Needs Students

The term Special Needs applies to students who are identified as disadvantaged, handicapped, or talented and gifted. Federal and state laws, as well as local policy, affect the way special needs programs operate in each school division. Because these laws and policies are subject to ongoing revisions, beginning teachers need to inquire about the special programs in their schools.

Students who seem to have learning difficulties are recommended for special education and must be declared eligible based on a number of factors. A variety of methods are used to determine the cause or causes of the student's condition. Classifications of special education students include

- Educable Mentally Retarded (EMR)
- Trainable Mentally Retarded (TMR)
- Hearing Impaired (HI)
- Multihandicapped (MH)
- Emotionally Disturbed (ED)
- Learning Disabled (LD).

Once a student has been declared eligible for special education, a committee designs an Individual Education Plan (IEP) for that student. The plan contains information such as the type of handicapping condition, the student's level of performance, and the annual goals and objectives for the student. The plan is updated yearly. The vocational teacher should be involved in this planning.

In addition to the legislation concerning students with learning difficulties, Virginia lawmakers have mandated that instructional opportunities be afforded students who are identified as talented and gifted. The Virginia Department of Education has identifed six areas of giftedness including an area called "Practical Arts Ability" for students in vocational education.

The beginning teacher should arrange to meet with the special education teacher and the guidance counselors in his or her school as early in the school year as possible. The special education teacher can provide valuable aid in helping to educate the special needs student. For example, students who have problems with their vision may be classified as special needs. The special education teacher may be able to provide support by obtaining large-print textbooks and other aids for these students. The guidance counselors may also be able to provide helpful information about programs for the gifted as well as information about the students in your classes. For example, you may discover that a certain student must take prescribed medication at specific times each day or that one of your students has recently experienced a trauma, such as the death of a parent or sibling. Close cooperation with the counselors and other specialists in the school or school division enables you to provide the best education possible for your students.

Teaching

If telling were teaching, everyone would be an educator. Assisting the student to learn involves modeling, showing, explaining, reviewing, and evaluating. Teachers plan and organize their instruction (more information on this aspect follows in the next two sections); they determine the most appropriate way to teach the material (see the section "Teaching Methods and Instructional Aids"); and they evaluate student learning (see the section "Evaluating Student Achievement."). In each of these sections, you will find suggestions for ways to enhance your teaching. Below are some general teaching tips recommended by successful T & I teachers.

- Teach all of the students in the class. Make a conscious effort to speak with all of your students rather than always calling on the same one or two individuals.
- Call students by name.
- Maintain eye contact; look at the students when you speak or when they speak to you.
- Help students who request assistance. In addition, ensure that students who do not ask for help understand what is being taught. (Individuals may not ask for help if they are shy or have a disability such as a speech impediment.)
- Practice patience--the cornerstone of successful teaching.
- Praise students for specific accomplishments; encourage them to succeed.
- Let all of your students know you expect them to learn, to perform tasks well, and to exhibit appropriate classroom behavior. Be careful not to shun students who may have lower ability levels.
- Avoid sarcasm, ridicule, and name-calling ("dummy," "stupid," etc.).
- When grouping students for certain activities, use different methods for forming the groups. Avoid always grouping alphabetically, by age, or by ability.

Every teacher faces specific situations that he or she is unsure how to handle. In all likelihood, many very good teachers work in your school. Seek guidance from colleagues, your immediate supervisor, and your principal. These individuals possess years of teaching experience and know that nearly every beginning teacher will, at some point, feel a sense of being overwhelmed by the many demands of teaching. Their wisdom and experience may save you hours of frustration over how to handle a problem.

Characteristics of a Good Teacher

Over the years, experts have tried to ascertain why some people can teach and others cannot. Their research has revealed that some teachers have certain abilities that are crucial to success in the classroom or laboratory. By observing teachers in the classroom, the experts have found how these abilities are related to successful teaching. They have found that teachers who achieve success do the following:

Plan -- an old adage in T & I is "plan your work and work your plan." Teachers who make both long-range instructional plans as well as daily plans have specific goals for their students. In addition, planning means teachers

- incorporate new research and technology into the curriculum.
- identify community resources.
- coordinate activities with special school personnel (guidance counselors, media specialists, testing specialists, for example).
- organize special activities (field trips, guest speakers, VICA functions, etc.).

Implement Instructional Objectives--successful teachers communicate effectively. They

- explain the objectives of the lesson.
- give clear directions and assignments.
- respond in a specific and constructive way to student questions.
- make effective use of instructional time.
- conduct the lesson clearly and logically.
- differentiate between fact and opinion.

Provide for Individual Student Differences--as mentioned, each class is unique. Teachers handle these individual differences by

- devising special student assignments.
- arranging individual student conferences.
- using a combination of teaching techniques.
- using applicable school or system support services.
- offering opportunities for additional help or enrichment.

Manage the Learning Environment--the learning environment includes maintaining the physical layout of the shop and providing an atmosphere conducive to learning. Of prime importance is the constant consideration for safety. Teachers also

- establish and clearly communicate standards for student behavior.
- discipline students according to policy.
- acknowledge exemplary student behavior.

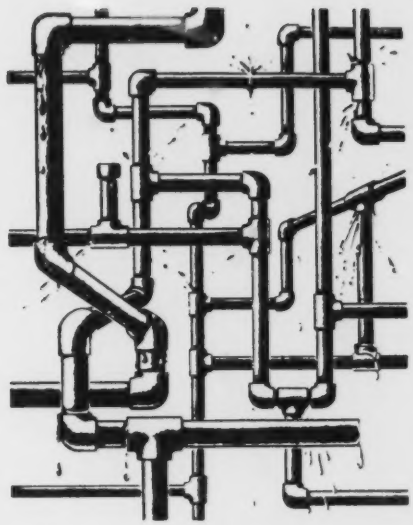
Assess Student Achievement--the ability to assess includes

- determining the skill or knowledge already possessed by the student.
- providing frequent indicators of student progress.
- preparing and administering evaluation material.
- keeping appropriate competency records and school-required information.
- recommending student placement.

Professional Attributes

As a beginning T & I instructor, you represent two occupations--the one you have been hired to teach and your new occupation--that of a teacher. Certain qualities can be found in all professional educators. These qualities include but are not limited to the following:

- **Fairness**--teachers who are described as fair are even-handed both in discipline and reward.
- **Courtesy**-- thoughtful teachers extend common courtesy both to colleagues and students alike.
- **Presence**--as you gain teaching experience, you will note that the teachers who command respect by their presence are those who are firm yet pleasant, composed, and sincere. These teachers know they set an example for their students in their appearance, attitude, and occupational expertise.
- **Safety Awareness**--the old saying, "practice what you preach" is in evidence every day in the conscientious teacher's shop.
- **Language**--profanity is not used or tolerated.



MANAGING THE CLASSROOM AND LABORATORY

Classroom/Laboratory Planning

Just as understanding how individuals learn must be considered in preparing to teach, other factors, too, must be considered. One major consideration is the classroom itself. Students will be working in your room most of the day. They will need to know such things as where tools are stored, how to obtain supplies, where to dispose of different types of waste (oil, chemicals, paper waste, etc.), and how to maintain equipment. Managing all aspects of the classroom and laboratory can be an awesome task, but careful planning and organization can minimize problems.

Evaluation of the Existing Facility

In preparing to teach the skills of your occupation, you need to determine what you have available in your laboratory. Every teacher would like to have state-of-the-art equipment, but school systems usually cannot afford to stay abreast of high technology. An evaluation of the existing classroom and laboratory will help not only in planning what to teach and how to teach it, but also in making recommendations for improvement.

As soon as possible, inspect and evaluate the classroom and laboratory. You may find it helpful to devise a checklist for the following items.

Repairs

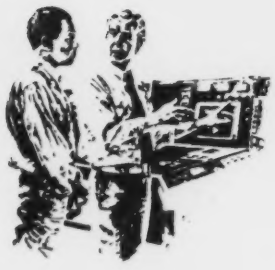
- Are there any broken desks, chairs, stools, tables, or other types of furniture in the class or laboratory?
- Are the lockers clean and in working order?
- Are the fire extinguishers fully charged? Are the inspection dates current?
- Are all of the lights (overhead, machine lamps, etc.) working properly?
- Are sinks, drains, and pipes clean and functioning properly?

- Are all of the machines in the laboratory clean, lubricated, and working properly? Have manufacturers' specifications for maintanence and inspection been met?
- Are the tools and equipment in the laboratory safe to use and stored properly?
- Are fans, ventilators, dust collectors, and other exhaust systems working properly?
- Are the windows intact, and do they open and close properly? Are the doors in working order?

Once you have compiled a list of the types of repairs needed, determine the procedure for reporting this information. Some school systems require that certain forms be completed; others require that a designated administrator be notified.

Another area to evaluate is the space in your classroom and laboratory. Some vocational subjects such as drafting are taught in only one room; whereas, classes such as auto body repair, plumbing, and welding usually occupy two areas--1) a separate classroom or an area of the entire room that is organized as a class area, and 2) the laboratory area that contains the machinery, tools and equipment, and, in most cases, work stations where students practice the skills of the occupation. Some considerations for each area include the following:

Classroom

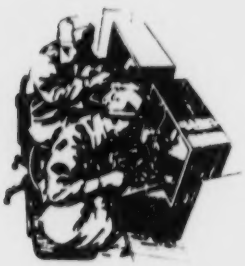


- Are there enough desks/seats for the number of students enrolled in your largest class?
- Are the desks/seats arranged so that each student can see a chalkboard or audiovisual screen?
- Is there a table or desk that can be used for demonstrations? If the students are seated, will they all be able to see demonstrations? Is there enough room for students to stand around the table to observe the demonstration?

Laboratory

- Is there enough room around the machines so that students can work safely?
- Are there enough work stations to accommodate the number of students enrolled?
- Are storage areas accessible? Can large or unwieldly items be moved without disrupting work areas?

As you consider space, you may think of better ways to organize the areas. Ascertaining the answers to the following questions may help you develop a plan for better organizing your facility.



- Are the machines and equipment arranged in a logical progression or order of use?
- Have traffic patterns been considered in the placement of machinery? Are safety zones marked around machinery?
- Is the room organized so that the teacher can observe the lab activities of all students?
- Have security provisions been made for the storage of special equipment?
- Have all safety issues been considered? (Additional safety concerns are discussed in the next section.)
  - -- Is there a main power disconnect switch? Is it accessible and clearly marked?
  - -- Is there a first aid kit or station? Is it accessible and clearly marked?
  - -- Are emergency phone numbers posted by the telephone?
  - -- Are exits and fire alarms easily accessible?
  - -- Is there proper storage space for hazardous material?

-- Are machines and equipment arranged safely (flammable liquids stored away from open flames, etc.)?

-- Does the room have proper lighting? Are additional sources of light needed?

-- Have efforts been made to control excessive noise?

-- Is the room well ventilated? Are any additional ventilation systems needed?

Management Procedures

Once students start to practice the skills of the occupation, the machines, equipment, and supplies in your room will be in almost constant use. Procedures for maintenance, cleaning, and inventory are an integral part of managing a vocational program. T & I teachers recommend the following guidelines in developing management procedures.

Tool and Equipment Maintenance

- Develop a schedule for routine repair and maintenance of equipment and machinery.
- Compile a list of manufacturers' service representatives.
- Develop a method of recording the operation, maintenance, and service of equipment and machinery.
- Develop a system for handling emergency services.

Laboratory Cleaning and Maintenance

- Determine the maintenance services performed by the school maintenance staff.
- List the maintenance services that will be performed as part of the instructional program.
- Develop a plan for monitoring and recording student performance of maintenance procedures.

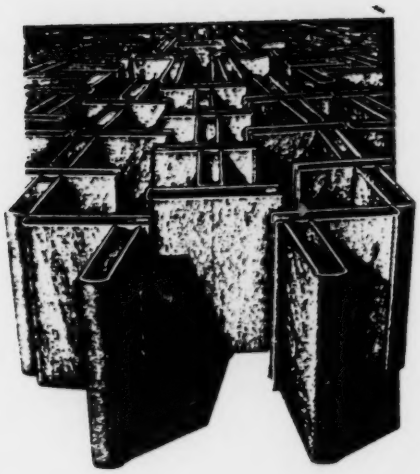
Tool, Equipment, and Supply Inventory

- Develop an inventory of the tools, equipment, and supplies on hand.
- Determine the need to add or replace items.
- Develop a procedure for periodically adding or replacing tools and equipment.
- Develop an inventory of instructional material (textbooks, shop manuals, etc.) and a procedure for accurate accounting of this material.

Laboratory Management

- Develop a plan for the acquisition, storage, distribution, and perpetual inventory of supplies.
- Develop a plan for the acquisition, storage, and distribution of tools.
- Organize a student personnel system. (Personnel systems often follow the actual organization of the occupation under study. For example, the plan may provide for students to rotate through assignments such as shop superintendant, tool supervisor, clean-up supervisor, etc. Discuss personnel systems with your colleagues and principal before implementing such a plan.)

Establishing procedures to maintain an orderly lab frees the teacher from a daily barrage of student questions concerning where tools are stored, who is responsible for clean-up, how to obtain supplies, how to maintain equipment, and many similar queries. In addition, these procedures help ensure that machinery is maintained and serviced, and supplies are available as needed to perform each task. Of most importance, it allows both the teacher and the students to work in a clean, safe environment that is conducive to learning.



ORGANIZING COURSE CONTENT

Course of Study

To plan your course of study for the school year, you need to decide what to teach, how to teach it, and when to teach it. Before developing a plan of instruction for the year, determine the following:

- Is there an approved curriculum guide available? In an effort to help teachers, the T & I Education service of the Virginia Department of Education has had curriculum material developed for some programs. Ask your principal, your local director, or your T & I state supervisor about the material available for your program. (See Appendix A.)
- If you are teaching an established course, does the instructor who taught the course before you have any material that you might use?
- Are there similar programs being taught in your school system? Seek guidance from the teachers of these programs.
- Is your course articulated (taught in cooperation) with a local community college or university? The teachers in those areas may be able to help you.

Once you have reviewed the resources, determine the major instructional areas (in an occupation, these areas would correspond to worker duty areas). For example, in a printing class, some of the major instructional topics might include "Handling Customer Orders," "Producing Composition," "Performing Camera and Darkroom Operations," and "Performing Stripping Operations." In a cosmetology program, instructional units might include "Shampooing and Conditioning Hair," "Coloring Hair," "Styling and Fitting Wigs and Hairpieces," and "Shaping Hair." To aid in this planning, many teachers use a plan book in which they also mark holidays, examination periods, grading periods (six-weeks or nine-weeks reporting periods), assemblies, field trips, and other items that should be considered in planning for the year. A sample monthly plan is presented in Appendix E.

Another important component in the development of T & I curriculum is the advisory council. Local vocational advisory councils work with the school board and

school administrators in determining policies for the direction of vocational education. T & I teachers should also establish their own occupational (craft, trade) committees to advise them of employment trends, curriculum direction, and technological advances. General information about state and local advisory councils is presented in the section "The State View." Your principal or immediate supervisor will be able to provide information about establishing a committee for your own program.

Daily Instruction

After you have developed a course outline of the major instructional areas, you then need to consider lesson plans and daily instruction. The major instructional areas need to be broken down into teaching units. In the printing class example cited earlier, the duty area " Handling Customer Orders" might contain tasks such as "prepare work order," "estimate job cost," and "maintain customer records." How these tasks will be taught is developed in a lesson plan. The lesson plan will show each step needed to teach the task including the mathematic, science, and communication skills that apply to the task. For example, in the task "estimate job cost" mentioned above, the instructor may need to review or teach certain mathematic skills such as adding decimals, interpreting charts, and determining averages.

Lesson plans can be organized and presented in many different ways, but one of the more widely accepted plans covers four major areas. The outline on the following page illustrates the four major steps of an instructional plan.

I. Preparation

A. Prepare yourself.

1. Review the lesson.
2. Prepare equipment, material, and supplies.

B. Prepare the learner.

1. Stimulate the students' interest; elicit students' prior knowledge and experience about the subject.

2. Explain the objective and the reasons for learning the lesson. Review what the students learned yesterday, and explain how the material studied previously relates to what they will learn today.

II. Presentation

A. Explain the facts, skills, and new terminology.

B. Demonstrate, illustrate, or show step-by-step the process or procedure.

C. Ask questions to ascertain student understanding; repeat aspects of the presentation that are not understood.

III. Application

A. Have students practice the procedure or operation.

B. Ask questions.

C. Watch the students practice; correct mistakes; have students repeat the procedure.

D. Review major parts of the lesson.

IV. Evaluation

A. Test the students.

B. Determine student proficiency.

C. Evaluate the effectiveness of the instructional plan.

1. Do you need to reteach the task?
2. Could aspects of the presentation be improved?
3. Was the amount of material covered in the lesson appropriate?

Lesson Plans

As noted, lesson plan formats vary; some schools specify that a particular form be used. Two sample lesson plans follow. Both samples are two-page plans, and both are based on the four-step instructional plan presented on the preceding page. The first sample lesson plan illustrates the lesson plan format only--instructional information is not included. The second plan has been developed from information provided in a competency-based curriculum guide. Information about Virginia competency-based education is provided in the section "Implementing Competency-Based Education".

SAMPLE A

INSTRUCTOR'S LESSON PLAN

INSTRUCTOR:

Unit _____

Lesson _____

OBJECTIVE (lesson aim):

TEACHING AIDS:

MATERIAL:

REFERENCES:

I. PREPARATION (of the learner)

II. PRESENTATION (of the information)

Instructional Steps or Topics	Key Points (things to remember to do or say)

PRESENTATION (continued)

Instructional Steps or Topics	Key Points (things to remember to do or say)

III. APPLICATION (drill, illustrations, analogies, oral questions, or assignments)

IV. EVALUATION (final check on students' comprehension of materials presented)

Suggested reading for student:

The next lesson is: 43

SAMPLE B

LESSON PLAN
by

_____

Percentage of Enlargement or Reduction Required on Photographs
Lesson Title

Commercial Photography
Course

Generating Images and Preparing Copy
Instructional Unit (Duty Area)

Task/Competency (knowledge, skills, or attitudes student gains from instruction)

Mark percentages of enlargement or reduction required on photographs.

Performance Objective (expected conditions, performance, and standard)

Given photographs, comprehensive layout, grease pencil, ruler, pen, proportion wheel, T-square, triangle, and tracing paper, mark percentage of enlargement or reduction required on photographs. Indications or crop marks should be clear and easy to read, and should reflect the correct percentage needed to fit the photograph in the space allotted on the layout. The percentage and desired dimensions should appear on or be attached to the photograph correctly, and the original photograph must be undamaged.

Tools/Materials

Grease pencil
T-square
Triangle
Photographs
Tracing paper
Comprehensive layout
Proportion wheel
Blue nonreproducing pen/pencil
Steel rulers, standard and metric

Audiovisual Aids

Filmstrip/Cassette: *Producing for the Offset Process.* Bergwall.

References

Graphic Communications, 2nd ed., p. 50. Richard Broekhuizen.
Graphic Layout and Design, Section 7. Gerald Silver.

Student Assignments

1. Read assigned textbook material.
2. Participate in classroom discussion of terminology, methods, and procedures.
3. Observe demonstration.
4. Practice various methods of determining percentage of enlargement and reduction.
5. Mark percentage of enlargement or reduction required on photographs.

Presentation (preparation, presentation, application, and evaluation)

I. Preparation (Motivation, Introduction)

- A. Reasons for calculating percentage of enlargement or reduction
- B. Uses (artwork, photo, copy)
- C. Evaluation method

II. Presentation

- A. Display of layout and photograph marked appropriately
- B. Definition of terminology
- C. Demonstration
  1. Discussion of any safety procedures
  2. Cropping
  3. Determining percentage of enlargement or reduction
  4. Procedures for marking percentages of enlargements and reductions
  5. Marking methods
- D. Handouts
  1. Student task sheet
  2. Student information sheet

III. Application (How skill can be used; what students will do)

- A. Identification of method
- B. Calculation of percentages
- C. Application of cropping marks
- D. Indication of desired dimensions in appropriate way

IV. Evaluation

Photograph with dimensions calculated and marked correctly

Criterion-Referenced Measure

Indications marked so that they are clear, easy to read, and reflect correct percentage needed; percentage and desired dimensions on or attached to photograph correctly; original photograph undamaged.

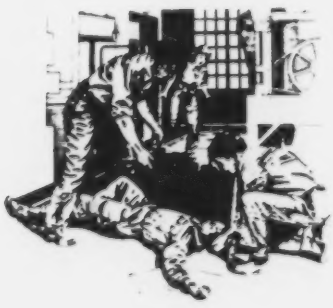
Special Notes (Resource persons, results, follow-up)

Safety

One very important aspect of the instructional plan is safety. Just as safety is a key word in the industrial workplace, safety in the school setting cannot be overemphasized. You are responsible for the safety of your students. Federal, state, and local governments all have passed school legislation concerning safety, and teachers can be held liable for certain safety-related incidents. Because of these liabilities, you may want to ask your principal or immediate supervisor for advice concerning tort insurance.

As a beginning teacher, it is imperative that you request information from your principal or supervisor concerning local, state, and federal safety regulations. For instance, Virginia law mandates the use of "eye protective devices" in certain vocational classrooms. Once you have determined the regulations you have a responsibility to enforce, devise a safety plan to incorporate in the curriculum. Appendix B contains examples of safety-related forms that T & I teachers have devised for use in their programs. Some school systems have standard forms for use in all vocational classes; your principal can advise you as to the procedure used in your school. In devising your safety plan, you will want to consider student safety; safe use of machinery, tools, and equipment; and building, classroom, and laboratory safety.

Student Safety



In planning for student safety, some items to consider include

- policies regarding jewelry, rings, chains, etc.
- appropriate clothing and hair protection
- eye protection/protective shields
- ear protection
- correct lifting procedures

- correct methods of using tools, equipment, and machinery
- safety tests
- reporting of accidents or hazardous situations
- emergency procedures
- policies regarding laboratory behavior (no "horseplay," off-limit areas, etc.)
- use of electrical devices.

Machinery, Tools, and Equipment Safety

To learn the manipulative skills of an occupation, one must learn to use the "tools of the trade." An important part of your instruction will be how to use, maintain, and respect tools, machinery, and equipment. T & I teachers suggest the following guidelines.

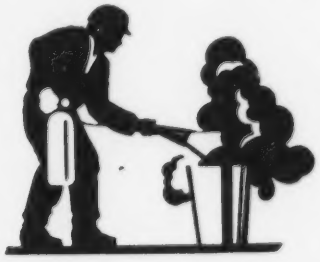
- Demonstrate how a machine operates before allowing students to operate it. Have students practice operating the machine while you observe. Be sure you are wearing the proper attire and protective equipment. This will help set a tone of safety consciousness in your laboratory.
- Require each student to achieve 100% accuracy on a safety test. Devise tests for specific machines. **File test results in student's competency record or file folder.**
- Do not allow students to operate machinery unsupervised. Maintain constant supervision.
- Ensure that all machines are securely anchored or bolted.
- Devise a maintenance schedule. Replace worn, frayed, or defective parts. Demonstrate the proper inspection, care, and maintenance of hand and power tools, equipment, and machinery.

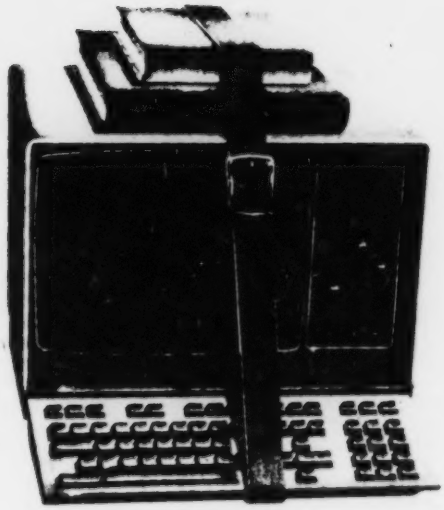
- Mark all safety zones around machines.
- Test all equipment and machinery before allowing students to operate them.
- Inspect wiring; check for proper grounding.

Building Safety

Some aspects of building safety were discussed in the context of managing the laboratory. Many are repeated here as you consider methods of incorporating safety in your instructional plan.

- How will you teach the types and operation of fire extinguishers?
- What is the school procedure for a fire drill or an evacuation of the building? What must the students know about shutting down machinery in case of an emergency?
- Will the ventilation systems in your laboratory handle the simultaneous use of machinery and equipment?
- Is the equipment arranged to allow room for students to work without congestion or hazard? Will you need to develop special multiple activities because of equipment arrangements?





TEACHING METHODS AND INSTRUCTIONAL AIDS

Teaching Methods

Good teachers achieve success because they use the best method to teach a particular topic. For example, the demonstration method is used quite often to show students how to perform an operation, such as how to operate a brick saw. Many T & I teachers arrange field trips to local industries so that students can see the actual workplace of the occupation under study. Another method is the integration of VICA activities in classroom instruction. Understanding the variety of teaching methods and how to make the best use of them strengthens your teaching. The importance of this subject is illustrated in the section "Teacher Licensure" where you will note that teaching methods is one of the college courses required for the Technical Professional License. This section contains basic background information that is explored fully in the teaching methods class.

Lecture

The lecture is one of the most often used teaching methods. Lecturing saves time. You can deliver a great deal of information to a large number of people in a short period of time. However, in the T & I classroom, the lecture is used most appropriately only on occasion--as a supplement to demonstrations and other teaching methods.

For example, you might use a lecture to give your electronics students background information about the atom, to explain the properties of yeast to your commercial foods class, or to tell your drafting class about the development of CAD systems.

Lectures do not allow for student involvement or participation, thus it can be difficult to maintain student interest. T & I teachers have found that good lecturers employ the following strategies.

- They do not read the material or recite a memorized presentation; they develop an outline of the lecture and use the outline to ensure that they cover all of the points.
- They speak clearly and make sure everyone in the class can hear the lecture.
- They maintain eye contact. They notice how their listeners are reacting.
- They avoid distracting mannerisms, such as jingling pocket change, tossing chalk, or removing and replacing eyeglasses.
- They move about the room as they speak.

Discussion

The guided discussion involves the use of questions to direct student learning. This method can be quite effective when teaching tasks involving reasoning skills or attitudes and behavior. The discussion can be used as a modified form of lecturing. Discussion encourages student participation as they consider what is being said and express their views. Another advantage of this method for teachers is the ability to catch and correct any misconceptions that students may have as revealed in their discussion. Like the lecture, the discussion method is best used to supplement the practical exercise and individualized instruction that are used most often in T & I classrooms.

When planning the use of discussion in your class, remember

- Students must have certain background information or knowledge to discuss a topic intelligently.

- Plan an introduction to the discussion.
- Encourage student questions, and allow students time to form responses to your questions.
- Note questions to use to move the discussion to the desired point.
- Prepare a summary to reinforce what has been brought out and learned through the discussion.

Demonstration

One of the methods used more often in T & I classes, the demonstration involves actually showing the students a process or procedure. Teachers demonstrate how to operate a brick saw, how to use a soldering iron, how to read a voltmeter, and how to replace a brake pad in classroom demonstrations.

Demonstrations can be an especially effective method of teaching because students not only hear the lesson but also they see the lesson performed in a step-by-step procedure. Because students hear and see the lesson in a practical or work-type environment, their learning is reinforced. T & I teachers have suggested the following tips.

Plan carefully. Devise a checklist to make sure you have everything you need.

Practice the demonstration before presenting it to your students; make sure everything works; make sure you can present the information logically and clearly, so that the students will understand the procedure. Demonstrations can sometimes be most difficult because you may have to perform the task in an awkward manner to ensure that all of your students can see and hear you.

After practicing the demonstration, assemble the equipment and material before your students come to class. It is difficult to maintain student interest if you interrupt the demonstration to find a tool or piece of equipment.

Use actual tools, equipment, and material whenever possible. When it is not possible to use the actual equipment, use a mock-up or a model. Charts and pictures may also be used to illustrate finer points.

Explain the purpose of the demonstration before you start. Use questions and other techniques as appropriate to determine student understanding as you proceed through the demonstration.

Practical Exercise

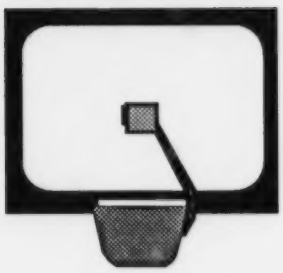
In the T & I class, the practical exercise or performance method is used quite often because this method is based on allowing students to perform or practice the task using, when possible, the tools and equipment of the occupation under study. Students have the opportunity to practice and refine skills. Although this method is perhaps the best way to teach occupational skills, you should keep in mind the following:

safety and supervision. Demand safety precautions be observed. Ensure students are working in a controlled, supervised environment.

equipment and supplies. Student practice means machines will break, supplies will be used, and equipment will have to be maintained. Plan carefully to ensure your material will last. It is difficult to practice putting in a brick windowsill if there is no sand to make mortar.

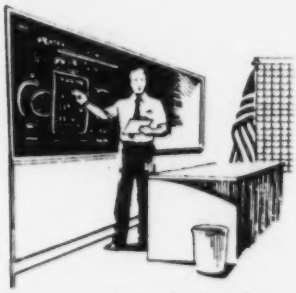
your time. Practical exercise involves small group and individualized instruction. Many T & I teachers use job sheets or information sheets as a means of directing student activity. This allows each student to work through the exercise and provides an opportunity for the teacher to move about the room, observe the work, correct mistakes, answer questions, and reinforce learning by asking questions or discussing procedures.

Instructional Aids



Instructional aids abound. They include something as simple as an information sheet to something as complicated as a simulator. Posters, filmstrips, records, chalkboards, models, charts, videotapes, cassettes, and slides can all be classified as instructional aids. No matter how you classify them, they have the same purpose--to supplement and reinforce teaching. Their usefulness and merit are only as good as the care and planning that go into their implementation in your instruction.

Chalkboard



Certainly one of the most reliable aids, the chalkboard is not subject to mechanical failure. You do not have to worry about it breaking down. You do have to worry about writing large enough and clearly enough so that everyone in the room can see what has been written. Different colored chalk can help in diagrams and illustrations, but some chalk colors do not show up well. Stand at the back of the room; can you read what has been written or see what has been drawn? As you teach, use the chalkboard.

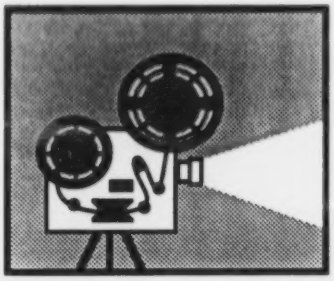
Write new terms on the chalkboard. This allows students to see the words as well as hear the pronunciation.

Write formulas, conversions, or other items you especially want to stress.

Draw diagrams, schematics, or other types of illustrations.

If you have a great deal of information to impart, write it on the board before students come to class, or, even better, use information sheets that can be duplicated and given to individual students. You save time and free the chalkboard for more effective uses.

Audiovisuals

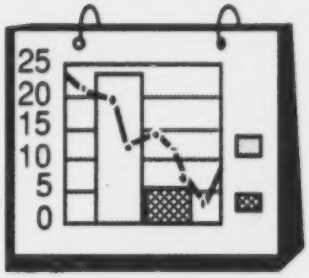


Audiovisuals is a term that is sometimes used to refer to anything that can be seen or heard. For this brief discussion, filmstrips, films, cassette tapes, records, slides, videotapes, and transparencies fall into the audiovisual aid category. Like all instructional aids, audiovisuals are effective if they supplement, not replace, instruction. Audiovisual aids can be used to enhance instruction: a film depicting robotic units will make a far more lasting impression than having students simply read two or three pages in a textbook.

A prerequisite in determining the effective use of an audiovisual is previewing the film, slides, tape, etc. before using it in the classroom. By previewing you can

- introduce in advance new terminology used in the audiovisual program.
- determine if the program is out-of-date, presents incorrect information, or is so badly scratched or worn as to be ineffective.
- determine if the program is too advanced or too simple for your students.
- decide exactly where in your instructional plan to incorporate the program.
- time the program. In most cases running time is noted somewhere on the product. However, if you plan to stop the program to discuss a point, reinforce something taught in class, or have the students write something down, you need to calculate class time and audiovisual time.
- determine that the audiovisual equipment is working.

Charts



Items such as posters, diagrams, maps, and pictures fall into this category. You will probably find many good commercial products available. However, there are times when having the students develop wall charts is a good instructional activity, especially in safety-related areas. Charts can serve as constant reminders, such as a safety warning; a quick reference, such as the periodic table of elements; or as a means of reinforcing learning, such as examples of types of resistors, soldering fluxes, etc.

Models and Mock-Ups

Models and mock-ups are used often in T & I classrooms. A mock-up of the body's circulatory system is an extremely important aid in health instruction. Equipment that is either too large or too expensive for the classroom can be represented in a model. Components of engines or the innerworkings of a machine may be reproduced as a mock-up or model. As with any instructional aid, the use of models should be carefully planned.

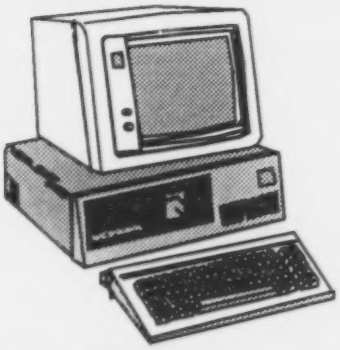
- What is the purpose of introducing the model or mock-up?
- Should the presentation be made in a certain sequence?
- Is the classroom arranged so that each student can see and hear your presentation?
- Will you need to be assisted by others as you proceed through the sequence?
- Have you allowed time for student questions?
- Have you allowed time for each student to study the model or mock-up?

Simulators

Simulators, such as driver's education trainers, may be used to simulate a situation. Quite often trainers are expensive and may only be used for individual instruction. Since school systems may only be able to afford one or two trainers, their introduction and use must be carefully planned. For example,

- What is the purpose of the simulator?
- Have you planned a demonstration of the use of the simulator? What should be demonstrated first, second, and so forth?
- Have you allowed enough time to repeat any steps in the demonstration?
- Have you considered viewing angles? Can each student see every step of the demonstration? Would your demonstration be more effective if you presented the information to a few students at a time?
- Will handouts be used during the demonstration?
- Do all of your students have assignments on which they can work while a few students practice a simulation?

Computers



Teachers may use computers in several ways. Some teachers have their own personal computers and use them mainly for recordkeeping, inventory, and word processing. The use of computers in the classroom has grown tremendously, and programs such as computer-assisted drafting (CAD) are becoming more and more prevalent. However, computers are not a substitute for instruction; in some ways, their incorporation in the instructional plan demands additional instructional time. Teachers need to ascertain the computer literacy of their students in order to incorporate computer use effectively. Students should understand the basic

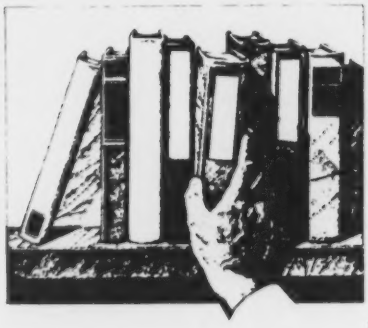
operation of the system, how to use the peripheral equipment, and how to handle and store disks, just to name a few considerations. Software, of course, is all-important in planning instruction and, like other aids, should be previewed prior to classroom use.

Printed Instructional Aids

Printed aids can be thought of in two categories: handouts and references.

Handouts include information sheets, job sheets, and checklists. Handouts are often teacher-developed because of learning differences from class to class and because as you teach, you learn better ways to teach. Handouts save instructional time. They can be used to provide background information (information sheets), provide evaluation information (checklists), and help set a more realistic occupational setting (jobsheets).

References include textbooks, operators' manuals, cross-reference manuals, and books such as the National Electrical Code, a dictionary, or any of the many works that constitute a good reference collection.



IMPLEMENTING COMPETENCY-BASED EDUCATION

Competency-Based Education

As noted earlier, vocational education programs in Virginia are competency based. Competency-based education, often called CBE, is defined as an instructional method that requires specific student performance on identified jobs or tasks that are relevant to the role of the worker in the occupation under study. In competency-based vocational programs, students learn the knowledge, skills, and attitudes that will enable them either to be employed or to continue their study in an advanced training program or an institution of higher learning. Your principal will provide you with specific information about the implementation of CBE in your school. Information pertinent to all Trade and Industrial Education programs follows.

Characteristics of Competency-Based Education

CBE course content is based upon the actual jobs or tasks performed by the worker. To identify these tasks, workers are questioned about the tasks they perform, the tools and equipment they use, and the way successful task completion is measured. This research is then used to form the basis of a competency-based course.

CBE is task oriented. In a CBE program, the mastery of a skill, knowledge, or behavior is the objective, not the time it takes for a student to learn. Students move from task to task as they demonstrate mastery of each task, not according to a specified number of hours or days spent on the task.

CBE includes all domains of learning. In specifying the implementation of CBE, the Virginia Department of Education also indicated that all three domains of learning be incorporated. Students master competencies related to manipulative skills (the psychomotor domain), knowledge areas (the cognitive domain), and behaviors and attitudes (the affective domain). (More information about the domains of learning is presented in the section "Evaluating Student Achievement.")

State Standards for Competency-Based Education

In directing the implementation of CBE, the Virginia Department of Education has established four state standards.

Standard I.	**Role-relevant competencies that include standards are identified and stated.**

Requires:
A. a validated task/competency list for each vocational program
B. a performance objective for each validated task/competency.

Standard II.	**Competencies are specified to students prior to instruction.**

Requires: A system for providing task/competency information to students prior to instruction.

Standard III.	**Criterion-referenced measures are used to measure achievement of competencies.**

Requires:
A. a criterion-referenced measure for each validated task/competency
B. a testing and evaluation procedure that tests the performance objective and is criterion-based.

Standard IV.	**A system exists for documenting the competencies achieved by each student.**

Requires: A system that has task/competency records/profiles for student achievement in each vocational program, course, or unit.

Implementation of these four standards requires the support of special curriculum material. To aid in the development of this material, the Department of Education funds the Virginia Vocational Curriculum and Resource Center. (See "The State View" section for more information on the services provided by the Center.)

Virginia Competency-Based Curriculum Material

Curriculum material produced for Virginia vocational educators falls into three main categories: task lists, task analyses, and special publications. A list of the Trade and Industrial Education publications is provided in Appendix A. All state curriculum products are subject to adaptation by the local school system. T & I teachers meet with their local occupational or craft committees to determine the tasks that should be taught to ensure students are learning the skills needed for employment.

A **task list** contains a list of the occupational entry-level tasks. The tasks are grouped into worker duty areas. The sample page below is taken from *Task Listing for Welding.*

DUTY AREA: 2. IDENTIFYING PLANT SAFETY

TASK/COMPETENCY

2.1	List personal safety equipment.
2.2	Identify combustibles.
2.3	Describe cranes, safety zones, and lifting equipment as they relate to plant safety.
2.4	Explain safe use of motorized equipment.
2.5	Identify the types of fire extinguishers and their uses.

The next type of curriculum material is a **task analyses** guide. In this type of document, each task is analyzed. A performance objective and the criterion-referenced measure for each task are specified (State Standards I, III).

The performance objective contains three components: 1) condition, 2) performance, and 3) standard.

1. The **condition** indicates what is provided for the student during his or her demonstration of task mastery and may give the conditions under which the demonstration will take place. The condition statement begins with "given."

   Example 1.

   "Given a studio recording situation and hand, lavalier, wireless, shotgun, and boom microphones..."

   Example 2.

   "'Given 10 color-coded resistors..."

   Example 3.

   "Given a 35mm single lens reflex camera and a roll of 35mm film..."

2. The **performance** states what the student is to do. The performance includes the task statement. In the following examples, the task statement is listed first, and the condition and performance components of the performance objective follow.

   Example 1. Select wiring methods.

   "Given switches, associated hardware, and necessary tools and equipment, *select a wiring method for a designated situation...*"

   Example 2. Develop a resume.

   "Given information on the types and purposes of a resume, *develop a resume stating qualifications for a job in the electrical trade...*"

3. The **standard** explains the criteria for successful performance; standards must be observable or measurable, such as code or zoning requirements, manufacturer's specifications, an instructor's checklist, an operator's manual, a percentage of accuracy, or an industry standard. The standard is reflected also in the criterion-referenced measure. The condition, performance, and standard make up a complete performance objective as illustrated below.

   Example 1.

   > "Given a sample blueprint, interpret the blueprint by identifying the alphabet of lines. Six different types of lines on the blueprint must be identified correctly as determined by a comparison with the instructor's master blueprint."

The criterion-referenced measure (CRM) is based on the standard in the performance objective and tells how student performance will be evaluated. In the task analyses guides, the CRM follows the performance objective and is written in an abbreviated form to eliminate repetition.

Examples include

- written test, 90% accuracy
- instructor-prepared checklist, all items rated acceptable
- inventory sheet, 80% of items located, identified, and their functions explained
- monitor set up, EEE standards.

In addition to the task statement, performance objective, and criterion-referenced measure, the task analysis includes suggested instructional activities, called enabling objectives, that may be used to teach the task. Task analyses guides were originally developed with two pages devoted to each task. A sample of the two-page format follows.

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DUTY AREA

8. IDENTIFYING SOLID STATE CHARACTERISTICS

TASK/COMPETENCY

8.9 Classify integrated circuits

----------Application----------

PROGRAM

Electronics (47.0101)

COURSE

Electronics II (8537)

8.9

PERFORMANCE OBJECTIVE

P8.9 Given a data sheet, reference manuals, and 10 integrated circuits (various packaging), classify integrated circuits. The following specifications for each circuit must be located in the manual and noted on the data sheet: a) supply voltage; b) operating temperature range; c) grounds; d) power dissipation; and e) linear or nonlinear classification. Specifications for at least 8 of the 10 circuits must be completed within 40 minutes.

SELECTED ENABLING OBJECTIVES

E8.9.1 Define monolithic, thick-film, thin-film, integrated circuit (IC), and linear.

E8.9.2 Explain the differences between linear integrated circuits and nonlinear integrated circuits.

E8.9.3 Describe applications of linear and nonlinear integrated circuits.

E8.9.4 Identify common linear IC packages, pin assignments, and schematic representations.

E8.9.5 List handling precautions.

E8.9.6 Identify information found in reference manuals.

CRITERION-REFERENCED MEASURE

C8.9 Specifications for 8 of 10 integrated circuits correct and completed within 40 minutes

SELECTED INSTRUCTIONAL ACTIVITIES

1. Define and discuss integrated circuit concepts (E8.9.1, E8.9.2).
2. Explain applications of linear integrated circuits (video amplifiers, op amps, RF amplifiers) and nonlinear integrated circuits (computer chips, calculator chips) (E8.9.3).
3. Demonstrate how to locate information in the reference manuals. Discuss information found in the appendix (E8.9.4, E8.9.6).
4. Discuss electrostatic discharge (ESD), fragile pins, and other concerns associated with handling integrated circuits (E8.9.5).

SELECTED TOOLS AND MATERIALS

Assorted integrated circuits
Reference manuals (National Semiconductor Handbook)

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Basic Electronics, 5th ed., Chapter 32. Grob.
Electricity-Electronics Fundamentals: A Text-Lab Manual, 2nd ed. Zbar and Sloop.
Electronic Devices and Circuit Analysis. Pallas.
Introduction to Digital Electronics. Hajek.

More recent task analyses guides contain one page for each task. References and additional information are listed at the end of the duty area. A sample of the one-page format is shown below.

DUTY AREA **COURSE**

2. OPERATING STUDIO EQUIPMENT TELEVISION PRODUCTION I (8622)

TASK/COMPETENCY

2.5 Execute camera commands.

PERFORMANCE OBJECTIVE

P2.5 Given a television camera, headset, and a subject to shoot, execute camera commands accurately and in a timely manner.

CRITERION-REFERENCED MEASURE

C2.5 15 of 20 camera commands executed correctly in 90 seconds, instructor's checklist

ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Explain and demonstrate the rule of thirds.
2. Discuss elements of composition.
3. List and define camera commands.
4. Explain the importance of accurate and timely execution of commands.
5. Demonstrate proper focusing techniques.
6. List types of camera shots and explain each.
7. Frame camera shots, and have students identify each.

Special publications include documents such as the *T & I Service Area Resource,* which contains general information applicable to all T & I programs. *Gearing Up for Success*, another special T & I publication, has been developed for use in teaching employability skills. These documents are available free of charge. Your principal, vocational director, or area state supervisor can assist you in obtaining T & I publications.

Recordkeeping

State Standard IV refers to an individual recordkeeping system but does not specify the type. Many school systems have adopted a form for use in their vocational programs. A sample competency record is shown on the next page. Additional samples are provided in the *T & I Service Area Resource.*

Competency records provide a clear indication of the student's progress in your class. Parents, school personnel such as guidance counselors, and prospective employers find these records of more benefit than a grade book because they can see at a glance exactly what the students have studied and practiced and how well they have performed each task. Again, school policy usually dictates how these records are maintained, filed, and used.

Competency Record

Name _____ SSN _____ School(s) _____

Secondary Program _____ Instructor _____

Rating System:

4--Highly Proficient:	The student can complete task quickly and accurately, can direct others in how to do task, and needs only normal supervision.
3--Competent:	The student can do all parts of the task, needs only spot check of completed work, meets minimum entry-level requirements, and needs job entry supervision.
2--Partially Proficient:	The student can do most parts of the task, needs help only on hardest parts, may not meet all job entry-level requirements for speed and accuracy, and needs close supervision.
1--Limited:	The student can do simple parts of task, needs to be told or shown how to do most of task, and needs extremely close supervision.
0--Cannot Perform:	The student cannot perform any part of task at a level sufficient for participation in a work environment.
X--Task Not Attempted:	The student did not attempt the task.

Task No.	Task/Competency	Grade	Date	Initials

SAMPLE

EVALUATING STUDENT ACHIEVEMENT

Testing

In the secondary school, student ability levels, learning, and performance are usually evaluated through tests--standardized tests, teacher-developed written tests, and, often in the T & I classroom, performance tests. Obviously, the assessment of student learning is crucial, and the importance of all phases of student evaluation cannot be overemphasized. It is beyond the scope of this document to delve into the many aspects of testing, assessment, and evaluation; such a study is provided in teacher-education courses offered by many colleges and universities. Some basic aspects of testing are included in this section.

Purposes of Testing

Tests may be administered for a variety of reasons as noted above, but often they are used for the following purposes:

Assessment of Student Learning--instructional time can be wasted by teaching something the students already know. Many vocational teachers administer pretests such as a skill test to determine the students' knowledge of certain hand tools.

Evaluation of Instruction--testing is one way to evaluate how well the student has learned what you taught. If the majority of your students have difficulty with a test or operation, you need to investigate. The problem may be with the test itself (reading level too difficult, ambiguous instructions, etc.), or the problem may have been caused by a number of other factors. For instance,

- Have you tried to cover too much material in too short a period of time?
- Are the students being tested in other classes the same day that you administer a test?

- Have the students not really mastered a competency considered a prerequisite to the competency now being tested?

Grades--requirements for assigning grades to document student achievement vary from school division to school division, but most systems require that letter grades (A, B, C, etc.) be assigned for report card purposes. Grading scales also vary: in some schools, an A is awarded for grades that fall within the scale of 90-100. In others, an A equates to grades within the 95-100 bracket.

Placement--test results may also be used in determining how well prepared the students are for the next step, level, or unit. In some cases, your course may be a prerequisite for another course, and the evaluation of a student's skill and knowledge is essential before recommending advanced study.

Motivation--testing is one method of motivating students to learn and to succeed.

Test Administration

The following list of questions provides some points to consider before giving a test to your students.

- Have you read the test? Read it aloud. Are the instructions clear? Are the test items precise and unambiguous?
- Have you taken the test? Are the steps in a performance test logical, safe, and complete? Have you tested what you taught?
- How long did it take you to complete the test? Have you allowed enough time for all of your students to complete the test?
- Do you need to make any modifications or adaptations for special needs students?
- Is the environment conducive to testing? Check lighting, ventilation, heating/cooling, and other factors that might be a distraction to students taking a test.

- Do the students have enough space to perform the operation safely and effectively? Do students have desks or tables where they can work on written tests? Does each student have enough room for the test, answer sheet, and any other material you might assign to be used?

- Have you attempted to arrange an uninterrupted time period (for example, a sign on your door such as "Testing in Progress")?

T & I teachers have recommended some additional guidelines that you may find helpful.

- Inform the students in advance of the purpose of the test and explain how the results of the test will be used. For example, most T & I instructors require students to pass a safety test before they are allowed to operate certain machinery.

- Before testing begins, tell students how much time they are allowed to complete the test. Read aloud all written instructions contained in the test.

- Reduce the opportunities for cheating:

  — have students use a cover sheet.
  — have students clear their desks or work area of everything except what is needed for the test.
  — do not allow any talking while testing is in progress.

- Attempt to motivate students by explaining the benefits of the test. Provide an opportunity for students to ask questions or clarify instructions before they begin the test. Emphasize special instructions, time limits, scoring, and safety considerations.

Kinds of Tests

During the year, you will administer two major kinds of tests: written tests and performance tests. Written objective tests are used most often to measure cognitive learning. The cognitive domain of learning includes thinking, understanding, and

reasoning skills. Psychomotor learning--learning based on the use of physical skills--is usually measured most effectively through performance testing. In addition, teachers sometimes use interviews, questionnaires, and observations to measure affective learning--the attitudes, values, emotions, and interests of their students. By using both written and performance tests as a means of evaluation, teachers stress the importance of communication skills, writing skills, and critical thinking skills in addition to the mastery of actual occupational competencies. What types of tests to give and how often tests should be given are questions you will want to discuss with your principal before school begins. Most school systems have testing and grade determination requirements. The information provided below may help you as you plan how to meet these requirements.

Objective Tests

Objective tests may be composed of multiple-choice, true-false, or matching test items. One advantage of objective tests is the relative ease of grading. Some school systems have optic scanners or other means of grading objective tests. Teachers sometimes use answer sheets to facilitate grading. Some considerations for each type of objective test follow.

True-False Tests

True-false tests are used to measure learning in the cognitive domain. These tests usually consist of a series of statements. Students determine whether each statement is true or false. True-false tests may be designed several different ways as illustrated in the following examples.

Example 1. True-False Variety

1. The rubber of a saddle t-clamp needs replacing if the rubber is shiny and smooth. T F

Example 2. Yes-No Variety

1. Should dry ice be used to remove vinyl tile? Y N

Example 3. Right-Wrong Variety

1. (5 + 3) x 2=16 R W

The true-false test is popular because it can be graded quickly. Ease of grading may not outweigh the drawbacks of a true-false test. True-false statements take time to construct. In addition, students stand an equal chance of guessing the right answer, so it is difficult for the teacher to evaluate student understanding. Some teachers find that their students remember the "wrong" answers they have picked up from a false statement, and the teacher must then reteach the subject.

Multiple-Choice Tests

Multiple-choice tests are used quite often because of their versatility. Test items can be devised to measure knowledge, understanding, and higher order problem-solving skills of the cognitive domain. They can be used also in measuring psychomotor and affective learning.

A multiple-choice test item has either a question or an incomplete statement as the stem. Following the stem is a list of at least four choices. Only one of the choices is the correct response. The student is usually directed to write the letter of the correct answer in the blank provided or on an answer sheet. The examples that

follow illustrate a multiple-choice stem that is an incomplete statement and one that presents a question.

Example 1.

____ 1. To lay a stretcher course, the head joints must be gauged at

a. 1/4"
b. 7/8"
c. 3/8"
d. 5/8"

Example 2.

___ 2. Three 10-ohm resistors are connected in series. What is their total resistance?

a. 10 ohms
b. 3 1/3 ohms
c. 3 ohms
d. 30 ohms

Guessing the correct answer is more difficult on a multiple-choice test because of the higher number of choices. However, constructing a good multiple-choice test is time consuming because the responses provided should be logical and may vary only in degree of correctness. Detailed information about constructing multiple-choice tests as well as other objective tests is presented in *Measuring Student Growth* by Richard Erickson and Tim Wentling (see Bibliography).

Matching Tests

Matching tests are made up of two lists or a list and a labeled diagram, photograph, or chart. Students are given instructions on how to relate one list to the other and how to indicate their responses. In the following sample, students match the pictures or illustrations of hand tools with the appropriate name of the tool.

Directions: Column A contains a list of hand tools used by carpenters. Column B contains a series of pictures of these hand tools. Select the picture that matches the name of the tool and write the letter in the blank provided in Column A.

A	B
____ Hammer	a.
____ Handsaw	b.
____ Rule	c.
____ Square	d.
____ Plane	e.
____ Brace and bit	f.

Although matching tests can be graded quickly, they may be difficult to construct. Instructions are very important in a matching test, especially if the lists are uneven or if some items have more than one response.

Structured Response Tests

Two of the more often used structured response tests include the completion test and the essay test. Although these tests require more time to grade, teachers incorporate these types of test questions to emphasize the importance of vocabulary development, spelling, and critical thinking skills in addition to content knowledge.

Completion Tests

A completion test, also called fill-in-the-blank, is considered one of the easier tests to construct. A statement is written with a word or phrase omitted and a blank inserted in its place. The student must recall and write in the correct word or phrase; thus, students do not benefit from guessing. Unless carefully constructed, this type of test may involve subjective scoring as students write in synonyms or partially correct answers. Also, the instructor may find it difficult to evaluate how much the student does understand.

> Example: The _____ is found in the braking system.

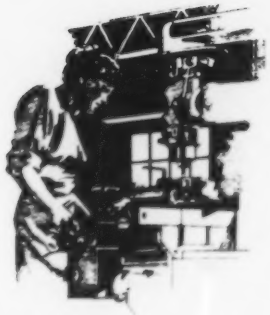
A problem may develop here if drum brakes and disc brakes both have been studied. Also, it would appear that the student could write in several different answers, each of which would be correct. A more specific statement would save the teacher time in grading by not having to allow for as many answers and would give a clearer picture of the student's understanding. The following example is more specific and also contains the blanks correctly placed at the end of the statement.

> Example: Drum brake assemblies include a hydraulic wheel cylinder, brake shoes and linings, and the _____ _____.

Essay Tests

Essay tests, if carefully constructed, can be used effectively to measure cognitive learning. However, essay tests take quite a bit of time to score. Unless the essay questions are planned carefully, scoring can be quite subjective. A question as vague as, "Discuss nonferrous metals" can be made easier to grade and provide a better measure of student understanding if written, "Name four nonferrous metals and the most common smelting process associated with each."

Performance Tests



In Trade and Industrial Education, emphasis is placed on performance testing rather than the traditional written test associated with testing in general education. A performance test is based on the manipulative skills needed to master a task or competency. For example, a performance test might be administered on soldering copper, threading pipe, applying a rinse, operating a studio camera, erecting scaffolding, or mixing concrete. Performance tests can also be designed to encourage problem-solving skill development. Many instructors design trouble-shooting performance tests for this reason.

Because performance tests must be administered to each student in exactly the same way, it is important to determine the most effective, consistent, and economical way to give the test. As noted in the section "Implementing Competency-Based Education," performance objectives and criterion-referenced measures indicate the condition, performance, standard, and method of evaluation for each task.

Performance tests involving a process are often evaluated by using a checklist. Components usually found in a checklist are illustrated in the sample below.

Instructor's Checklist

Student Name _____ Date _____

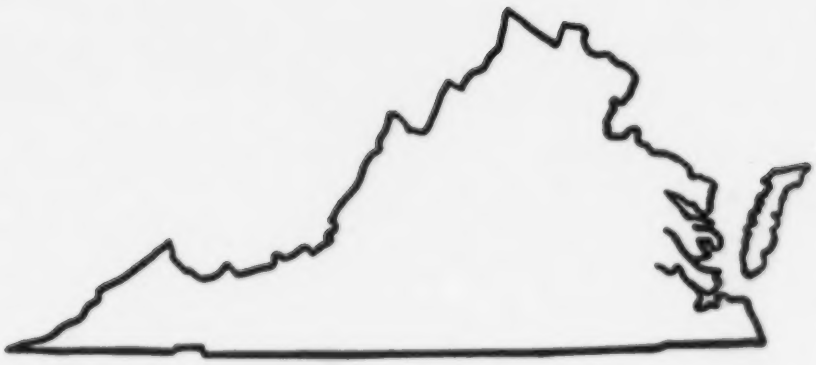
Task: Cut threads with hand taps.

	Rating	
The Student	Acceptable	Unacceptable
1. Secured workpiece in holding device.		
2. Located hole position.		
3. Selected proper tap drill.		

The items listed on the checklist should be critical steps involved in the process, and the items should be listed in the exact sequence as the operation is performed. If speed or timing is involved, directions and provisions for noting these factors should be included. Some instructors add a column or a space for comments.

If the performance test involves a product, a rating scale is most often used. The rating scale should contain all of the components necessary to meet an acceptable standard. For example, in rating a salad dressing, items such as consistency, flavor, appearance, and presentation might be rated. Ratings might include excellent, good, fair, and poor. Additional information about constructing checklists and rating forms can be found in *How to Evaluate Students in a CBVE Program* produced by the Maryland Vocational Curriculum Production Project (see Bibliography).

Performance tests can be used to determine students' grades and to complement students' competency records. However, because the equipment and material available for performance testing varies from school to school, instructors find they often have to develop their own checklists, rating scales, or other forms of evaluation.



THE STATE VIEW

The Virginia Department of Education

The Virginia Department of Education is located in the Monroe Building, 101 14th Street, Richmond, Virginia. Student Services is one unit of the entire Department of Education and is composed of three divisions: (1) Early Childhood, (2) Pre and Early Adolescent, and (3) Adolescent Education.

Trade and Industrial Education Statewide Program

As a Trade and Industrial Education teacher, you join approximately 900 other professionals who teach over 37,000 students in laboratory programs throughout the Commonwealth of Virginia. The Trade and Industrial Education state staff will assist you in as many ways as possible. The T & I service is located within the division of Adolescent Education. State staff members can be reached by phoning (804) 225-3300 or 371-6286. Correspondence should be addressed to

Trade and Industrial Education
Post Office Box 2120
Richmond, Virginia 23216

Virginia Association of Trade and Industrial Education (VATIE)

The Virginia Association of Trade and Industrial Education (VATIE) is a professional organization for administrators and teachers who support quality T & I programs. VATIE members contribute to policy development by providing representation to the Virginia Vocational Association Executive Board and by supporting legislation beneficial to Trade and Industrial Education. In addition, VATIE serves as a contracting agency with state colleges and universities for the provision of courses for college and non-college credit. VATIE is the state branch of the National

Association for Trade and Industrial Education (NATIE). NATIE cooperates with the American Vocational Association (AVA); provides information to the United States Congress, the Department of Labor, and the Department of Education; and encourages business, labor, and management support of Trade and Industrial Education.

Vocational Industrial Clubs of America (VICA)

The Vocational Industrial Clubs of America (VICA) is a national organization for Trade and Industrial Education students that offers leadership, citizenship, and character development programs and activities to complement classroom instruction. The Virginia VICA Association is one of the larger state associations in National VICA. The state association is organized into districts. The Chief Executive Officer of Virginia VICA may be reached by calling (804) 225-3243 or by writing

Virginia VICA Association
P. O. Box 2120
Richmond, VA 23216.

Additional information may be found in Appendix C.

Advisory Councils

Virginia State Advisory Council on Vocational Education

Federal law mandates the establishment and operation of a state advisory council. The governor of Virginia appoints representatives of various sectors of society to serve on the council. The Virginia State Advisory Council advises the Virginia State Board of Vocational Education in the development of the annual

vocational program plan and the vocational accountability report. Local education agencies may request assistance from the council in the establishment and operation of local advisory councils.

Local Advisory Councils

In certain situations involving federal financial assistance, federal legislation requires the establishment of local advisory councils. Local advisory councils assist local education officials in developing an annual vocational plan and make recommendations based on occupational trends and needs in the community. Local advisory councils can be most helpful to vocational educators in that they provide first-hand information on technological advances in the workplace, business trends, and skills needed for entry-level employment. Additional information about local advisory councils as well as occupational committees can be found in *A Guide for...Local Advisory Councils for Vocational Education*.

Virginia Vocational Curriculum and Resource Center

The Virginia Vocational Curriculum and Resource Center is located in Glen Allen, Virginia and is administered by Henrico County Public Schools, Department of Vocational and Community Education. As noted in the section "Implementing Competency-Based Education," the Center serves vocational educators throughout Virginia in several ways. At the direction of the Department of Education, the Center develops and produces curriculum products. The Center maintains a lending library from which vocational teachers may borrow curriculum guides and other resources. The Center also distributes Virginia CBE curriculum material, as well as catalogs produced by the Vocational-Technical Education Consortium of States (V-TECS). Items in the warehouse are available free of charge to Virginia public school vocational educators. Appendix A contains a list of T & I resources available from the Center. To obtain further information about the services and resources provided by the Center, call (804) 261-5075 or write

Virginia Vocational Curriculum and Resource Center
2200 Mountain Road
Glen Allen, VA 23060-2208.

Gender Equity

The Vocational Gender Equity office of the Department of Education encourages efforts by vocational educators to ensure that young men and women are allowed to enroll in courses based on their interests and abilities rather than on their gender. Thus, young men who have the interest and aptitude in cosmetology or nursing and young women who find they have abilities in areas such as drafting or electronics are encouraged to enroll in the appropriate courses.

In addition, the Gender Equity office deals with issues such as sexist language in reference material, displaced homemakers, and career options. Gender equity resources are housed in the Virginia Gender Equity Resource Center, a project of the Virginia Vocational Curriculum and Resource Center. Center holdings include posters, bookmarks, and brochures, all of which are provided to vocational educators at no charge. To obtain more information about the services and resources of the Center, call (804) 261-5075 or write

Virginia Gender Equity Resource Center
2200 Mountain Road
Glen Allen, VA 23060-2208.

TEACHER

LICENSURE

Technical Professional Licensure

As a beginning T & I teacher, you have been issued a Provisional License. This license is a nonrenewable three-year license issued to qualified applicants who seek a renewable five-year Technical Professional License. Teachers interested in entering a postsecondary degree program should talk with their principals, college professors, and vocational directors. Many colleges and universities offer programs for individuals who can attend college only in the evening.

To receive a Technical Professional License, the applicant must first pass the National Occupational Competency Test for the specific trade area. Also, the applicant must complete nine semester hours of college credit in the following course areas:

(a) curriculum design and development--three hours
(b) teaching strategies--three hours
(c) program/classroom/lab management--three hours.

In addition, the local school division must submit a recommendation that the Technical Professional License be issued.

Four universities in Virginia offer approved T & I courses that fulfill these requirements. The four schools are

James Madison University
Center for Vocational Education
Maury Hall
Harrisonburg, Virginia 22807

Norfolk State University
Department of Industrial Technology Education
2401 Coprew Avenue
Norfolk, Virginia 23504

Virginia Polytechnic Institute and State University
Division of Vocational and Technical Education
100 Lane Hall
Blacksburg, Virginia 24061

Virginia State University
Department of Industrial Education and Technology
Box N
Petersburg, Virginia 23803

Courses are offered on the campus of each university, and, on occasion, at selected off-campus locations. (Courses are offered in various off-campus locations when enrollment figures are high enough to allow it.)

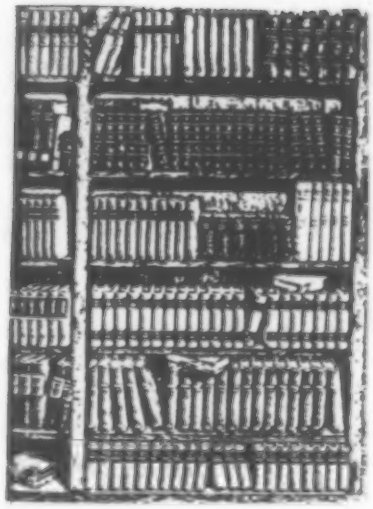
The local school division's recommendation for issuance of a Technical Professional License to you is based in part upon an evaluation of your teaching. Each school division has its own evaluation forms and procedures. The following T & I competency list covers many of the areas that are examined and evaluated.

Trade and Industrial Education Teaching Competencies

The T & I instructor

- Can use instructional plans.
- Can select equipment, materials, and supplies.
- Knows procedures for obtaining materials and supplies.
- Makes effective use of instructional handouts.
- Uses various methods of instruction effectively.
- Can use audiovisual equipment.
- Can obtain and effectively use resource persons.
- Can use performance tests.
- Can use written tests.
- Can record student achievement on a progress chart.
- Knows use of individual training plans.
- Knows how to maintain efficient filing system.
- Knows how to complete VERS forms.
- Can use duplicating equipment.
- Can organize occupational advisory committees.

- Can make effective use of advisory committees.
- Can organize a VICA section or chapter.
- Can manage a VICA section or chapter.
- Knows the purpose and function of professional organizations.
- Can make effective business and industry contacts.
- Employs good housekeeping procedures.
- Can manage an effective safety program.
- Maintains an effective student evaluation system.
- Demonstrates basic computer literacy.
- Can develop and administer safety tests.
- Develops and implements safety rules.
- Can effectively schedule live work.
- Can effectively utilize work orders.
- Can implement an effective quality control system.
- Follows a planned equipment maintenance program.
- Can conduct student conferences.
- Can conduct parent conferences.
- Can follow-up student absences.
- Implements an effective tool-management system.
- Conducts an effective student recruitment program.
- Provides related instruction regarding occupational information.
- Can provide an effective orientation program.
- Can provide students with an overview of course content.
- Can employ correct accounting procedures.
- Knows requirements for certificate renewal.
- Understands behavior characteristics of students.
- Can effectively maintain discipline.
- Can employ good human relations techniques.
- Can communicate effectively.
- Knows local school administrative organizational structure.
- Can coordinate instructional activities with available supplies.
- Knows emergency first aid procedures.
- Understands legal aspects of teaching.
- Recognizes the signs of drug abuse.
- Can effectively use constructive criticism.



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APPENDICES

APPENDIX A

RESOURCE MATERIAL

The following competency-based curriculum guides have been developed for use in Trade and Industrial Education programs. Use the checklist below to inventory the resources in your classroom. The three titles in bold print are appropriate for all T & I programs.

Virginia curriculum guides and other resources are stored at the Virginia Vocational Curriculum and Resource Center. Contact the Center at (804) 261-5075 to obtain the resources below. Additional resources are available in print as well as on diskette. Ask the Center staff to send you an order form.

____ Auto Body Repair Task Analyses
____ Automotive Mechanics/Servicing Task Analyses
____ Carpentry Tasks and Performance Objectives
____ Commercial Photography Task Analyses
____ Cosmetology Task Analyses
____ Electronics Task Analyses
____ **Gearing Up for Success: T & I Employability Skills Unit**
____ Industrial Cooperative Training Task Analyses
____ Law Enforcement Task Analyses
____ Machine Shop Task Analyses
____ Masonry Task Analyses
____ Radio and Television Repair Instructional Resource Guide
____ Residential/Industrial Electricity Task Analyses
____ Task Listing for Welding
____ Television Production Task Analyses
____ **Trade and Industrial Education Service Area Resource**
____ **Trade Related Academic Competencies (TRAC) ***

* To obtain a copy of this document, contact the project directors, Sherrie DeMoss or Mike Robinson, Woodrow Wilson Rehabilitation Center, Fisherville, Virginia 22939.

APPENDIX B

SAMPLE SAFETY FORMS

As noted, safety is a primary concern in any vocational program. Many school systems have developed a standard form that is used in all of their vocational classes. Before developing safety forms for your program, you should meet with your principal to ascertain all legal requirements.

The following sample forms were developed by T & I teachers for use in their classes. Samples A and B are examples of parental permission forms. Sample C is an example of a student safety pledge.

Sample A

(Name of School)
Power Tool Operation Permission Form

Dear Parent:

The operation of certain machines and equipment is considered an integral part of the instruction in this course. To operate this equipment, each student must first:

1. Read and sign the safety pledge.
2. Have parental permission to operate the machine.
3. Achieve 100% accuracy on a written test covering the safe operation of each machine.
4. Demonstrate to the instructor how to operate the machine safely.

MACHINERY AND EQUIPMENT

_____ (example: Lathe)	_____
_____ (example: Grinder)	_____
_____	_____
_____	_____
_____	_____

If you do not want your child to operate any of the above-mentioned machinery, please so indicate by drawing a line through the item. If you have any questions about the equipment, please feel free to call me.

_____
Teacher

_____
phone number

Signed _____
Parent or Guardian

Date _____

Sample B

(Name of School)
PERMISSION SLIP

My child _____ has my permission to operate the tools and equipment in the Trade and Industrial Education Architectural Drafting Program for the year 19 ___ - 19 ___ .

If an accident that requires professional services should occur, I prefer that he/she receive medical treatment from _____ hospital or Dr. _____

Address _____

Phone Number _____

Date _____ Signed _____
Parent or Guardian

Sample C
(Name of School)

Student Safety Pledge

I have read the safety instructions regarding the operation of the power-driven machines listed in the Safety Record (attached).

(Teacher's Name) has demonstrated to me the proper method of using each machine listed in my safety record, and has pointed out the danger of violating any of the safety instructions. (Teacher's name) has taught me how to avoid injury by observing the safety instructions and using the machines properly.

I have demonstrated my ability to use each of the machines listed in the attached Safety Record in the presence of (Teacher's Name). I understand how to avoid injury through the proper use of the machine. I am confident that I can operate these machines without injury to myself or others. (The result of each test is to be recorded in the safety record after the student has completed the test and met all other requirements.)

I have scored 100 percent on the written test covering the operation of each machine.

I hereby promise to observe the safety instructions and to follow the instructions given in the demonstrations.

I have read the above statements, and I realize that my signature is proof that I have fulfilled all the requirements mentioned. I am not required to sign this statement. I may take shop and receive credit without using the machines. I understand that if I use a machine, I do so at my own risk.

Signature _____

Date _____

Sample C - Attachment
Student Safety Record

Name _____
Last First Middle

Date of Birth _____
Day Month Year

Name of Machine	Date	Test Score*	Teacher's Signature

* Copy of Safety test on file in student's folder

APPENDIX C
VICA INFORMATION

Student Organizations

The Vocational Industrial Clubs of America (VICA) is an organization for students enrolled in Trade and Industrial Education courses. The policy statement on the following page indicates the committment of the United States Department of Education to vocational student organizations.

Policy of the United States Department of Education For Vocational Education Student Organizations

The United States Department of Education maintains a close relationship with ten vocational student organizations and welcomes their cooperation and support in strengthening programs of vocational education. Recognizing that the past performance and future potential of these ten organizations are compatible with the overall purposes and objectives of education today, the United States Department of Education strongly endorses their objectives and seeks to involve their thinking in the improvement of vocational education.

In view of this, these policies represent the position of the United States Department of Education:

1. The United States Department of Education recognizes the educational programs and philosophies embraced by the following student organizations as being an integral part of vocational education instructional programs:

   American Industrial Arts Student Association
   Business Professionals of America
   Distributive Education Clubs of America
   Future Business Leaders of America-Phi Beta Lambda
   Future Farmers of America
   Future Homemakers of America
   Health Occupations Students of America
   National Postsecondary Agricultural Student Organization
   National Young Farmer Educational Association
   Vocational Industrial Clubs of America

2. The United States Department of Education recognizes the concept of total student development as being necessary for all vocational education students to assume successful roles in society and to enter the labor market.

3. The United States Department of Education will provide technical and supportive services to assist vocational student organizations and State agencies in their efforts to improve the quality and relevance of instruction, develop student leadership, enhance citizenship responsibilities, overcome sex and race discrimination and stereotyping, and serve students of special populations.

4. The United States Department of Education recognizes the responsibility for vocational instructional programs and related activities, including vocational student organizations, rests with the State and local education agencies.

5. The United States Department of Education approves of Federal and State grant funds for vocational education to be used by the States to give leadership and support to these vocational student organizations and activities directly related to established vocational education instructional programs at all levels under provisions of approved State plans for vocational education.

Efforts on the part of State and local education agencies to recognize and encourage the growth and development of these vocational student organizations are highly important and deserve the support of all leaders in American education.

William J. Bennett
Secretary of Education

Bonnie Guiton
Assistant Secretary for
Vocational and Adult Education

April 11, 1988
Date

Forming a VICA Club

The guidelines listed below serve as an outline of the steps to follow in organizing a VICA Club. A detailed factsheet "How to Form a VICA Club" and other VICA information may be obtained from the Virginia VICA Chief Executive Officer.

1. Contact the Virginia VICA Chief Executive Officer for information about the club charter, club constitution, membership rosters, etc.
2. Conduct a membership campaign.
3. Complete membership rosters and submit to the proper personnel.
4. Hold elections and installation ceremonies for club officers. Begin procedures for training officers.
5. Identify goals, establish committees, and develop a VICA Program of Work for the year.
6. Begin activities as identified in the Program of Work.
7. Hold fund-raisers.
8. Prepare for local, state, and national contests.
9. Arrange for students to attend local, district, state, and national conferences.
10. VICA publications, membership roster packets, and VICA supplies are available from National VICA, P.O. Box 3000, Leesburg, Virginia 22075, phone 703-777-8810.

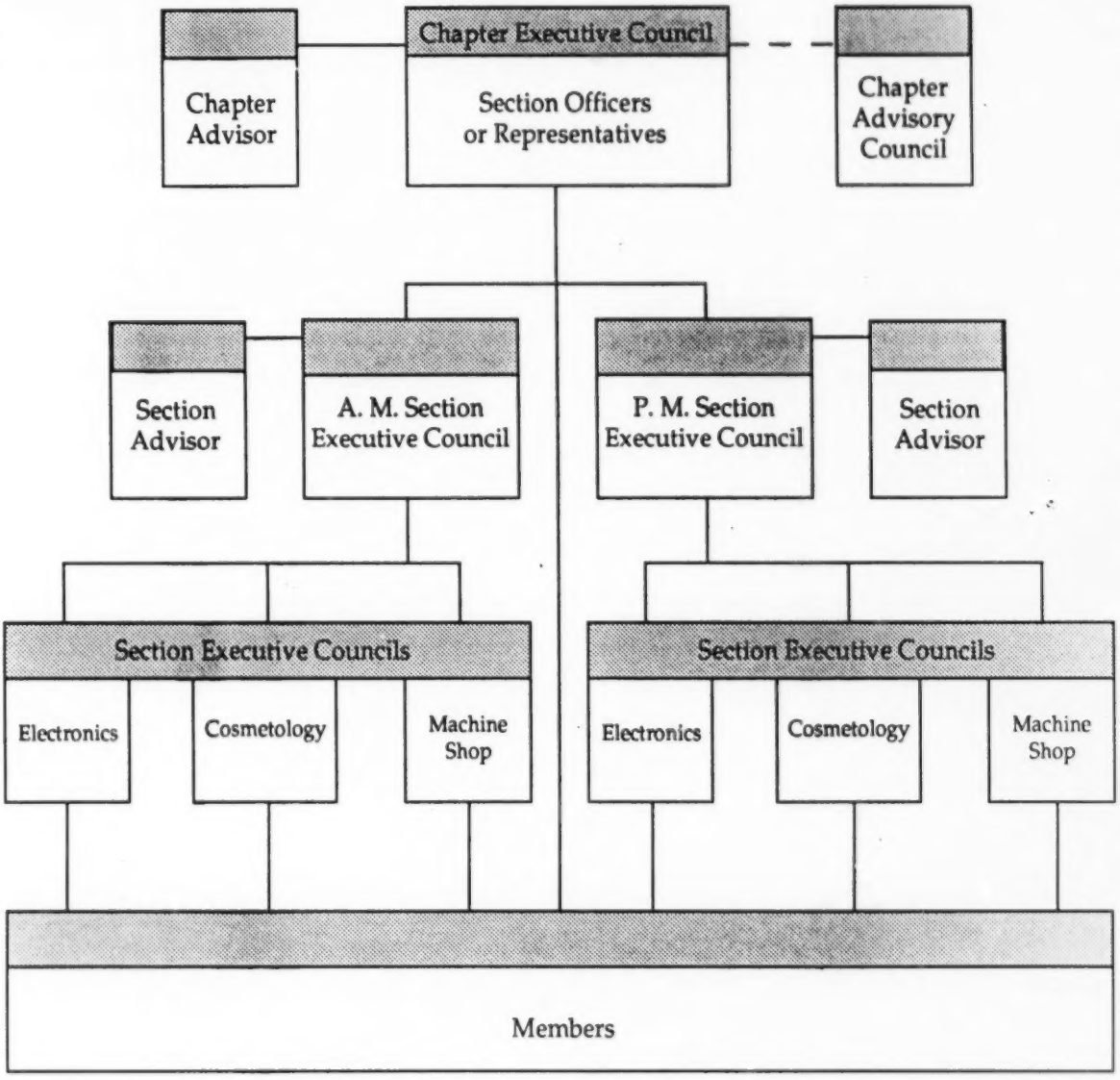
VICA Professional Development Program

To help teachers integrate VICA activities in their instructional program and to encourage the development of student leadership and employability skills, National VICA has developed the VICA Professional Development Program (PDP). The program is non-competitive and allows for the recognition of individual students as they develop professional and occupational skills. Students earn degrees as they master skill and leadership competencies. Material developed to implement the program includes an advisor's guide, student guide, and competency profiles. More information about the program may be obtained from the Virginia VICA Chief Executive Officer.

Local VICA Chapter Structure

Vocational - Technical Centers

The chart below illustrates a suggested chapter organization in vocational schools where students attend for half-day sessions.



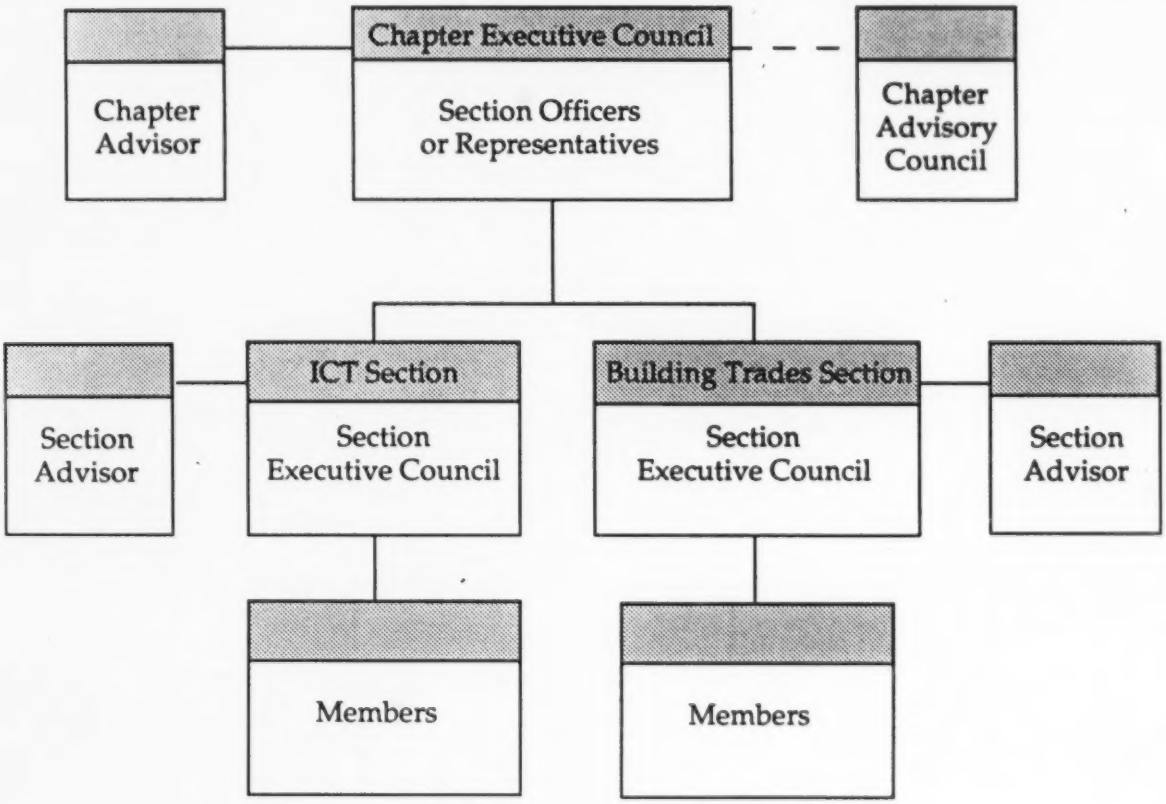
– – – – – – advisory

——— administrative

Local VICA Chapter Structure

Comprehensive High Schools

The chart below illustrates a suggested chapter organization in a comprehensive high school.



advisory

administrative

APPENDIX D

Discipline

These discipline tips were provided by a principal of a technical center. ***Discipline with Dignity***, a book by Richard Curwin and Allen Medler (published by the Association for Supervision and Curriculum Development, Alexandria, Virginia, 1988) has also been recommended.

Is Your Discipline Showing?

I. Look at yourself!

Evaluate your

- Self-Confidence
- Voice
- Enthusiasm
- Sense of humor
- Personal appearance
- Fairness
- Optimism
- Promptness
- Manners
- Attitude
- Understanding
- Values

II. Be poised!

A. Do not try to scare youngsters to death.
B. Develop mutual respect.
C. Do not threaten anything you cannot carry out.
D. Give students the security of knowing where they stand. . ."Certain behavior warrants certain results."
E. Follow the three "Fs": firmness, fairness, friendliness.

III. Be human!

A. We all have good days and bad days.
B. Anticipate the effect of special occasions.
C. Every person is a very special person.
D. Admit when you are wrong or when you do not know.

IV. Vary instructional techniques!

A. Organize group work.
B. Individualize instruction.
C. Use a variety of materials.
D. Have a broad knowledge of the subject matter.
E. Set high but reachable goals for students.
F. Remember the subject area is not the end in itself.

V. Get to know your students!

Learn to

- Understand their needs
- Accept them as they are
- Observe them closely
- Use their interests
- Understand their attitudes
- Put good human relations to work.

VI. Check physical features of the classroom!

A. Chairs do not need to be in rows.
B. Have desks and floors free of litter.
C. Put up beautiful pictures and posters.
D. Have attractive bulletin boards.
E. Create interest corners.

VII. Enjoy working with young people!

A. Be enthusiastic
B. Be optimistic
C. Build! Praise!
D. Role play!

VIII. Be the kind of teacher you like and admire!

APPENDIX E
PLANNING CONSIDERATIONS

In developing an instructional plan for the year, many teachers start by first reviewing the school calendar, noting vacation dates, special assemblies, teacher work days (days pupils do not attend school), grading periods, and other items that will affect their instructional time. They then record the dates of meetings and other functions for which they must prepare. This information is sometimes recorded in a monthly plan book. A sample monthly plan is presented on the following two pages. The sample presented does not contain any instructional information. Some teachers do note units of instruction they plan to teach during the month; however, other teachers develop a weekly plan book in which they indicate their day-by-day instructional plan.

FIRST SEMESTER

AUGUST	SEPTEMBER	OCTOBER
T & I Summer Conference (3rd - 6th) Teachers report (23rd) Teacher pre-service activities (24th - 26th) Equipment/supply inventory (25th) Meeting with Special Needs Teacher (25th) Faculty meeting (26th)	Classes begin (2nd) School assembly (3rd) Faculty meeting (3rd) Meeting with guidance counselor (4th) VICA Membership drive (10th-14th) Back-to-School Night (19th) VICA competition--State Fair of Virginia (22nd-26th)	Faculty meeting (6th) Grading period ends (8th) Advisory committee meting (12th) VICA State Fall Rally (15th) Field trip (22nd)
NOVEMBER	**DECEMBER**	**JANUARY**
Parent-teacher conferences (4th) Meeting with machinery service representatives (10th) Faculty meeting (18th) Grading period ends (22nd) Thanksgiving vacation (23rd - 24th)	Meeting with guidance counselors--scheduling (7th) School assembly (17th) VICA party (18th) Winter vacation (22nd - 2nd)	Grading period ends (19th) Mid-term exams (10th-24th) Equipment/supply inventory (25th)

SECOND SEMESTER

JANUARY	FEBRUARY	MARCH
Faculty meeting (26th) Teacher workday (26th) Second semester begins (27th)	Parent-teacher conferences (10th) Vocational Education Week (13th-17th) Student tours of vocational classes -- recruitment (20th-23rd)	Grading period ends (10th) VICA district contests (20th-24) Advisory committee meeting (28th) Teacher inservice program (29th)
APRIL	**MAY**	**JUNE**
Field trip (5th) Spring vacation (7th-12th) Grading period ends (24th)	Budget/equipment requisitions (11th) VICA State Leadership Conference (16th-19th) Meeting with industry representatives--student placement (22nd)	Final exams (7th-11th) Final grades (13th) Inventory (14th)

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